ANTHROPOMETRY OF THE OVIMBUNDU OF ANGOLA

BY

WILFRID D. HAMBLY

CURATOR, AFRICAN ETHNOLOGY

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PREFACE

The data presented in this publication were collected in the year 1929 by the Frederick H. Rawson–Field Museum Ethnological Expedition to West Africa. The expedition was concerned primarily with study of material cultures of Angola and the assembly of a representative collection of objects from the Ovimbundu, Vakwanyama, and Vachokwe tribes.

Nevertheless, some time was devoted to a study of social organization, religion, and other subjects that have been discussed in a previous publication (Hambly, 1934). At the end of the expeditionary period an effort was made to measure a sample of 100 Ovimbundu, at Elende, and to record some data bearing on size of families and mortality. Unfortunately, this object could not be achieved in the time available, but the data recorded for 53 adult males are valuable, owing to the great paucity of information. There are, I believe, no anthropometric measurements of the Ovimbundu available for comparison with my own data, but fortunately we have statistics for four adjacent tribes (Cardoso and Corrêa, 1916).

The object of this publication is to give a correct impression of the physique of Ovimbundu males by means of anthropometric measurements and photographs, and to compare these data with records for adjacent tribes. It is desirable also to contrast the somatological characters of the Ovimbundu with some Negro tribes of Africa, outside Angola. A few notes on corporal marks and dental deformation of the Ovimbundu are added, and a record of the size of families is given. The data were obtained by questioning subjects respecting the survival of their brothers and sisters, and the survival of their children.

The drawings were made by Staff Illustrator Carl F. Gronemann.

WILFRID DYSON HAMBLY

ANTHROPOMETRY OF THE OVIMBUNDU OF ANGOLA

I. TECHNIQUE

The measurements recorded (Table I) were based on instructions given in the Report of the British Association for the Advancement of Science (Cunningham, 1909). The instructions are as follows:

Head Measurements

Maximum Length.—From the most prominent point of the glabella to the most distant point in the middle line on the back of the head, known as the occipital point.

Maximum Breadth.—Measured wherever it can be found above the plane of the ear-holes. The callipers should be held in a vertical transverse plane and moved about until the maximum diameter is ascertained.

Minimum Frontal Diameter.—From one frontal crest to the other across the narrowest part of the forehead. For recent discussion of these measurements see Tildesley (1938).

Facial Measurements

Upper Face Length.—From nasion to the edge of the gum between the two upper central incisor teeth.

Total Face Length.—From nasion to the lower edge of the point of the chin.

Maximum Interzygomatic Breadth.—The maximum diameter between corresponding points on the opposite zygomatic arches.

Gonial Breadth.—The diameter between the extreme outer points of the angles of the lower jaw.

Nasal Measurements

Nasal Height.—From nasion to the subnasal point.

Nasal Breadth.—The greatest diameter, measured without pressure, between the wings of the nose.

Ear Measurements

Greatest Length of the Ear.—From the highest to the lowest point of the auricle.

Greatest Breadth of the Ear.—The maximum diameter at right angles to the length-line, from the ear basis to the hinder border of the auricle.

TRUNK MEASUREMENTS

Stature.—The subject is to be measured in the erect attitude, with his eyes directed to the horizon, his heels firmly planted, and the balls of the toes in contact with the ground. It is absolutely necessary that the subject should be symmetrically placed so that the mesial plane of the body is in every respect vertical.

Height of the Ear-hole.—Measured from the ground.

Height of the Acromion.—Measured from the ground.

Height Sitting.—This is the length of the trunk from the vertex of the head to the lowest points of the ischial tuberosities (height from seat).

Chest Circumference.—Ask the subject to raise his arms. Pass the tape horizontally round the chest at the level of the junction of the fourth rib-cartilage with the sternum or breast-bone, then lower the arms and hold the tape tightly. The measurement was made at the end of an expiration of the tidal air. There was no conscious effort on the part of the subject to inflate or deflate his chest.

INSTRUMENTS USED

The instruments used were those illustrated by Martin (1928, vol. 1). The callipers (*Tasterzirkel*) with blunt oval ends are shown on page 125 (Fig. 48). The *Gleitzirkel* are callipers with pointed ends, pictured on page 127 (Fig. 49). The use of the height-measuring instrument is recorded on page 153 (Fig. 66). For measuring the sitting height a box was used. This was squarely placed on perfectly level ground. The exact height of the seat was recorded and later subtracted from the total sitting height, which was measured from the ground.

DEFECTS IN TECHNIQUE

Table I indicates that measurements from the ground to the acromion were abandoned after 25 subjects had been measured, and the same is true for measurements from the ground to the ear-hole. These records were abandoned partly to save time for more important measurements, and to allow more opportunity for photography. Moreover, I felt uncertain as to the accuracy of calculating the height of the head in this way. The head-height calculation is made by subtracting from the total sitting height the sitting height

measured to the middle of the auditory meatus. The slightest deviation from a rigid upright posture during the recording of the two measurements causes a serious error. Yet, despite this objection to the technique, the measurements obtained for head height are what one might reasonably expect, with perhaps the exception of No. 2 (170 mm.) and No. 3 (160 mm.), which seem excessively high. The uncertainties entering into measurement of nasal heights, facial heights, and bigonial widths will be mentioned later when describing the variability of these traits.

Even if we discard the incomplete series of measurements for acromial height and head height, we have sufficient data to give a clear impression of head, face, and trunk. Our data for the cephalic index, the nasal index, and the stature enable us to make a comparison with those three characters as recorded by Cardoso and Corrêa (1916) for four tribes adjacent to the Ovimbundu.

Cardoso says little about technique, neither does he give individual measurements; he presents averages and ranges. But we have no choice in our selection of comparative anthropometrical data, for so far as I am aware no figures other than those of Cardoso are available for Angolan tribes.

II. OBSERVATIONS AND MEASUREMENTS ON FIFTY-THREE OVIMBUNDU MALES

(Tables I, II)

General Observations

Skin Color.—All were brown, and only four approached a shade that bordered on black. At the lighter end of the scale there were four subjects who might be described as "light brown+." The mode of the color distribution shows 19 individuals described as dark brown. The 46 observations on skin color are tabulated below:

Light++	Light+	Light	Dark	Dark+	Dark++
0	4	8	19	11	4

Reference to the skin color scheme of Martin (1928, vol. 2, p. 206) suggests that my "dark++" people are Martin's *grauschwarz* division. My "dark+" division is Martin's *schwarzbraun* class. The major "dark" division of 19 men is Martin's *dunkelbraun* class. Our "light brown" and "light+" are somewhat like Martin's *reinbraun* people, perhaps not quite so light. The color range of the Ovimbundu is distinctly lighter than among the west African Kru or Ibo, or among the Nilotic Dinka; and the general impression is one of medium to dark brown, with the lighter shades predominating among females.

Eyes.—All were dark brown, almost black, of tint No. 16, which is the darkest shown in the *Augenfarben-Tafel* of R. Martin and B. K. Schultz.

Hair.—All subjects had typical Negro hair. The facial hair was sparse even when allowed to develop to full growth. The most hirsute man observed is shown on Plate III. He had a well-developed moustache and chin tuft. There is little sign of hair on the chest, with the exception of the man shown on Plate X, No. 34.

Teeth.—Teeth are in good condition. See Plates XIX, XX, and Chapter VI, for notes on mutilation.

Scarification.—See Plates XXI–XXX, and Chapter VI, for notes on scarification.

Ear Lobes.—One man in three had his ear lobes completely joined to the cheeks. This is a Bushman trait, and since the Bushmen were at one time more numerous in Angola, and farther north than at present, the trait may have been derived from ancient admixture of stocks.

MEASUREMENTS AND INDICES

THE TRUNK

Standing Height (Fig. 4).—The average height is 1687.1 mm., which, according to the classification recommended by C. G. Seligman (1930, pp. 14–15), places the Ovimbundu just within the tall class characterized by a stature of 1680–1720 mm. One individual is of pygmy stature (1406 mm.) but he has no deformity. There are 21 men, nearly one-half the sample, of medium height (1580–1680 mm.). The mode lies at 1630–1722 mm., with 27 individuals in that class. If a height of more than 1720 mm. may be considered as "very tall" (Seligman), then 17 men, that is, about one-third of our sample, are in that class. Generally speaking, the population is "tall" to "very tall."

Sitting Height (Figs. 4, 5).—The average is 848.8 mm. The mode is 825–845 mm. The majority of the observations, namely, 36 out of 51, are in the range 825–885 mm. The average index of 50.3 indicates that the sitting height is half the standing height, and the form of the graph indicates that this relationship has only slight variability.

Chest Girth (Fig. 6).—The average chest girth is 828.0 mm. and the relationship (index) between chest girth and sitting height is 97.3 on the average. In other words the circumference of the chest is about equal to the sitting height. The majority of the indices (25 out of 47) lie in the range 95–100.

THE HEAD

Maximum Length (Fig. 7).—The average length is 187.3 mm., and the mode is the range between 182 mm. and 186 mm.

Maximum Breadth (Fig. 7).—The average breadth is 136.8 mm., and a frequency distribution of breadths shows the modal value between 132 mm. and 138 mm.

Cephalic Index.—The average cephalic index is 73.1, which brings our sample definitely within the dolichocephalic class, with index below 75. The frequency distribution of cephalic indices is of great value in showing that 77.3 per cent of our sample have cephalic indices between 70–75. The Ovimbundu are decidedly long-headed, only 22.6 per cent of the population having an index over 76.

Head Height.—For a sample of 25 measurements the average height is 135 mm.

TABLE I

MEASUREMENTS OF FIFTY-THREE ADULT MALES OF THE OVIMBUNDU TRIBE, ELENDE, ANGOLA

1 = Personal number; *2* = Standing height; *3* = Acromion to sole; *4* = Sitting height; *5* = Chest girth; *6* = Head length; *7* = Head breadth; *8* = Head height; *9* = Minimum frontal; *10* = Bizygomatic; *11* = Bigonial; *12* = Total facial height; *13* = Upper facial height; *14* = Nasal height; *15* = Nasal breadth; *16* = Ear breadth; *17* = Ear length

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*Skin color*	*Remarks*
1†	1694	....	872	820	184	133	132	100	123	83	113	65	48	43	33	50	light+	
2	1700	....	840	780	198	132	170	98	120	90	105	61	46	44	32	51	light+	
3*†	1745	1596	895	830	197	138	160	105	130	95	112	62	48	42	28	56	?	
4†	1800	1660	896	902	198	145	133	100	133	100	122	72	45	44	33	63	dark	Ear lobes joined to cheeks.
5	1720	1592	880	815	184	142	135	110	140	100	102	57	39	43	25	50	dark	
6	1846	1705	875	840	195	146	149	105	125	95	120	71	49	41	26	57	dark++	The tallest subject had a very tall mother; ear lobes joined to cheeks.
7	1695	....	890	875	194	140	126	102	115	100	116	70	49	48	30	62	?	Well-developed moustache, small beard.
8	1685	1546	885	844	185	135	122	105	130	101	123	70	54	44	34	59	dark+	Sparse hair on top lip and chin.
9	1758	1570	863	755	183	142	143	110	120	100	110	65	50	44	28	55	light+	Sparse facial hair.
10†	1735	1603	860	855	188	140	120	113	133	95	113	69	48	47	32	56	dark	
11	1634	1513	823	850	194	140	128	118	127	118	115	66	50	50	32	57	dark+	Ear lobes joined to cheeks; prognathic; head noticeably flat on top.
12*	1687	1543	838	830	194	138	128	95	120	130	124	72	55	41	30	60	dark	Hair fairly well developed on chin and top lip.
13	1674	1545	845	790	183	141	135	100	125	90	119	73	56	45	31	59	dark	Medium development of facial hair; ear lobes partly joined to cheeks.
14	1670	1543	844	850	179	133	123	104	120	117	108	66	47	45	27	58	?	
15	1775	1640	897	905	193	140	125	110	130	100	110	62	46	45	30	55	?	

TABLE I—*Continued*

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*Skin color*	*Remarks*
16	1815	1673	914	925	205	140	136	108	135	98	115	69	48	44	30	58	dark+	Sparse facial hair.
17*†	1660	1514	890	864	188	135	144	100	114	95	113	71	47	45	27	54	light+	Ear lobes joined to cheeks; sparse facial hair.
18	1600	1464	830	830	175	135	137	103	120	95	110	63	41	41	25	51	dark++	Ear lobes partially joined to cheeks.
19	1634	1490	847	860	190	140	141	105	125	90	111	66	48	42	27	56	dark++	Ear lobes perforated, joined to cheeks.
20	1605	1456	819	855	184	131	133	105	120	95	118	68	51	49	27	54	dark++	Facial hair fairly well developed.
21†	1725	1604	875	845	178	139	125	100	120	100	104	65	43	40	30	51	dark+	
22	1406	1291	725	695	182	127	120	100	120	95	103	70	46	41	31	56	?	
23	1616	1481	861	850	182	137	128	105	130	100	118	71	47	45	26	52	dark	Sparse facial hair.
24	1755	1617	...	900	187	141	...	107	135	100	115	67	50	42	30	60	dark+	
25	1653	1524	840	750	188	134	136	100	115	95	108	67	50	38	27	55	dark	Sparse facial hair.
26	1670	1538	886	790	178	138	...	102	116	100	110	67	45	40	30	45	dark	
27	1680	1535	862	870	185	144	145	100	115	100	120	74	47	37	30	51	dark+	Sparse facial hair; ear lobes joined to cheeks.
28	1723	1590	860	...	185	135	...	110	120	97	110	71	54	42	27	51	dark	Ear lobes joined to cheeks.
29†	1758	....	875	...	198	140	...	104	125	115	117	74	55	40	27	48	light	Facial hair very sparse.
30	1646	....	845	835	173	130	...	97	102	95	117	74	50	41	29	58	dark+	A little more beard than usual.
31†	1730	....	860	860	192	141	...	102	120	100	110	65	47	45	28	52	dark	
32*	1812	....	911	880	190	134	...	105	125	100	114	65	51	44	26	52	?	
33	1683	....	864	860	191	135	...	105	125	93	115	68	52	45	29	52	dark+	
34	1620	....	765	750	175	125	...	90	110	90	104	67	45	41	30	50	light	
35	1716	....	826	810	185	133	...	105	118	92	118	72	48	41	31	55	dark	
36	1638	....	804	...	190	140	...	118	125	95	104	60	45	43	34	54	dark	Sparse facial hair; ear lobes joined to cheeks.
37†	1680	....	873	840	194	141	...	107	125	112	118	74	52	43	31	55	dark+	
38	1750	....	876	720	188	133	...	104	116	90	115	65	50	39	30	55	light	Slight moustache; ear lobes joined to cheeks.
39	1620	....	795	825	194	135	...	100	125	95	120	71	53	45	24	51	dark	Facial hair fairly well developed.

*Scarification. †Tooth mutilation.

TABLE I—*Concluded*

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*Skin color*	*Remarks*
40*	1567	....	794	770	185	132	...	100	115	90	107	62	44	41	24	53	dark	Facial hair fairly well developed; ear lobes joined to cheeks.
41	1686	....	770	845	190	135	...	107	125	100	115	66	48	45	32	55	dark+	Ear lobes joined to cheeks.
42	1655	....	...	845	188	135	...	100	116	90	110	64	50	41	28	52	light	
43	1735	....	880	815	200	148	...	110	125	105	126	80	55	45	32	57	light	Ear lobes joined to cheeks; well-developed hair on upper lip.
44	1660	....	760	820	180	137	...	110	122	95	110	58	47	33	31	54	light	
45	1710	....	880	805	182	135	...	100	120	95	112	71	50	43	26	56	light	
46	1650	....	840	790	184	133	...	102	120	90	116	72	47	41	26	45	light	Ear lobes joined to cheeks.
47	1790	....	920	830	175	130	...	100	120	95	122	78	54	47	27	50	dark	Ear lobes joined to cheeks.
48	1728	....	832	810	188	140	...	105	120	95	122	68	47	42	30	58	dark+	
49	1690	....	809	870	189	140	...	112	125	95	118	77	52	44	30	49	dark	Ear lobes joined to cheeks.
50	1606	....	791	...	172	130	...	95	115	90	115	65	47	42	30	51	dark	Ear lobes joined to cheeks.
51	1645	....	834	785	185	134	...	101	122	100	117	64	45	40	31	50	dark	Ear lobes joined to cheeks.
52	1683	....	850	824	197	141	...	105	125	90	126	73	54	41	30	54	?	
53	1600	....	823	810	185	132	...	100	119	90	120	73	50	39	27	51	dark	Ear lobes joined to cheeks.

	2	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*
	(53)‡	(25)	(51)	(49)	(53)	(53)	(25)	(53)	(53)	(53)	(53)	(53)	(53)	(53)	(53)	(53)
Means	1687.1 ±6.7	1553.3 ±11.14	848.8 ±4.36	828.0 ±4.44	187.3 ±0.67	136.8 ±0.41	135.0 ±1.60	103.8 ±0.48	122.3 ±0.63	97.6 ±0.53	114.2 ±0.55	68.2 ±0.45	48.8 ±0.33	42.7 ±0.28	29.1 ±0.23	53.9 ±0.35
Coeff. of V.	4.29 ±0.28	5.32 ±0.51	5.44 ±0.36	5.56 ±0.38	3.87 ±0.25	3.27 ±0.21	8.81 ±0.84	5.00 ±0.33	5.60 ±0.37	8.26 ±0.54	5.18 ±0.34	7.13 ±0.47	7.29 ±0.48	6.93 ±0.45	8.59 ±0.56	7.09 ±0.46
Std. dev.	72.32 ±4.74	82.63 ±7.90	46.16 ±4.36	46.04 ±3.14	7.25 ±0.47	4.47 ±0.29	11.90 ±1.13	5.20 ±0.34	6.85 ±0.45	8.06 ±0.53	5.92 ±0.39	4.86 ±0.32	3.56 ±0.23	2.96 ±0.19	2.50 ±0.16	3.82 ±0.25

*Scarification. ‡Figures in parentheses indicate the number of men measured.

Cranial Capacity.—We have now the data for calculating cranial capacity from a formula. The dimensions of the living head of the Ovimbundu are 187.3 (length), 136.8 (breadth), and 135.0 (height). According to Isserlis (1914) the capacity of the Negro skull is

$$.0003849 \times \text{HLB} \pm 65/\sqrt{\text{N}}.$$

If we allow 8 mm. reduction in length, 4 mm. reduction in height, and 15 mm. reduction in breadth, to allow for the flesh, our dimensions become 179.3 mm., 121.8 mm., and 131.0 mm. for the length, breadth, and height, respectively. Then, according to the formula, the cranial capacity is 1101±8.9 cc., which seems somewhat low.

The inter-racial formula of Pearson (1904) is given as

$$.000337 \times \text{HLB} + 406.01.$$

This yields a more likely result of 1370 cc. as the cranial capacity.

Hooke's formula (1926) reads

$$.000366\ \text{H'LB} + 198.9 \pm 45.8/\sqrt{\text{N}}$$

and gives a capacity of 1246±6.3.

If we take the figures of cranial capacity assembled by Kitson (1931, Table IV, p. 292), the Teita skulls, 30 in number, are found to have a mean cranial capacity of 1316 cc., and 37 males of Tanganyika have a mean skull capacity of 1299.3 cc. Pearson's formula gives for the Ovimbundu a skull capacity compatible with all the figures quoted by Kitson. According to Pearson's formula the average cranial capacity of Ovimbundu males is 1370 cc., and the ranges of averages given by Kitson for various Negro samples of east, west, and south Africa is 1299–1422 cc.

THE FACE

Minimum Frontal Diameter (Fig. 8).—The average is 103.8 mm. The range of this measurement is from 90–118 mm., and 44 out of 53 measurements lie in the interval 99 mm. to 108 mm., so indicating a fairly low variability.

Bizygomatic Width (Fig. 8).—The average is 122.3 mm. The range of measurements, namely, 102–140 mm., is somewhat greater than that for the minimum frontal diameter. But 32 cases out of 53 lie in the interval 120–124 mm., and the distribution is therefore well concentrated in the small interval of 4 mm.

Bigonial Breadth (Fig. 10).—The average distance between the gonial angles is 97.6 mm., but the measurements are not closely concentrated. Out of 53 measurements 46 lie between 90–100 mm.

The extremes of the distribution are 83 mm. and 130 mm., a somewhat wide range.

Total Facial Height (Fig. 9).—The average is 114.2 mm. The range, 102–126 mm., and the distribution are rather widely scattered. Yet there is a definite modal value of 22 measurements out of 53. Nearly half the distribution is within the small range of 115–118 mm.

Upper Facial Height (Fig. 9).—The average is 68.2 mm., and the range is 57–80 mm. The distribution of measurements is not well concentrated.

Facial Indices.—The relationship of the upper facial height to the bizygomatic width is 55.9, and for the total facial height compared with the bizygomatic the index is 93.7. The jugomandibular index, which shows the proportion of the bigonial width to the bizygomatic, is 79.9. The jugofrontal index, expressing the minimum frontal diameter as a percentage of the bizygomatic, is 85.0.

THE NOSE

Nasal Height (Fig. 11).—The average is 48.8 mm., and the range is 39–56 mm. The distribution is fairly closely concentrated, since 38 measurements out of 53 lie in the small range of 44–50 mm., that is, within the compass of 6 mm.

Nasal Width (Fig. 11).—The average is 42.7 mm., and the range is 33–50 mm. The concentration of the distribution is within the small range of 4 mm. There are 43 out of 53 measurements lying between the values 40–44 mm.

Nasal Index.—The average nasal index is 87.9. If we consider 55–70 as leptorrhine values, 71–85 as mesorrhine, and 86–100 as platyrrhine, our average index (87.9) is just within the platyrrhine group. If the index had been two points lower, our sample of Ovimbundu would have been at the upper limit of the mesorrhine group. When we come to a comparison of our sample with other Negro tribes we shall probably find that the Ovimbundu have relatively narrow noses. With regard to the distribution of 53 nasal indices, 35.8 per cent of our men are mesorrhine, 58.5 per cent are platyrrhine, and only 5.7 per cent are hyperplatyrrhine (index 100+). Measurements on the nose show high variability.

THE EAR

Length.—The average length is 53.9 mm. The distribution is concentrated between 49–57 mm., and within this range of 8 mm. 44 out of the 53 observations lie.

Breadth.—The average breadth is 29.1 mm. The breadths are, however, more variable than the lengths; the mode lies at 31.0 mm., and 35 out of 53 observations are in the range 28–31 mm.

Index.—The average index is 54.0, so indicating that the width of ears is a little more than half their length. The mode of the distribution is close to an index of 50. The distribution is, however, somewhat scattered, the total range of the ear index being from 45–66. Out of 53 indices 37 range from 50–58.

VARIABILITY

If we ask which traits of the Ovimbundu are most variable, and which seem to be the most constant and well entrenched, the question can be answered by consulting the coefficients of variation for traits and indices (Tables I, II). We are comparing traits of the Ovimbundu *inter se* and without reference to the variability of corresponding traits in other Negro groups. The probable errors of the coefficients of variation are given in the tables, but here, for practical purposes, we may use only the coefficients. If these are placed in ascending order of magnitude the following arrangement results:

COEFFICIENTS OF VARIATION

1. Head breadth	3.27	13. Chest girth	5.56
2. Sitting height–standing height index	3.34	14. Bizygomatic	5.60
3. Cephalic index	3.45	15. Nasal width	6.93
4. Head length	3.87	16. Total facial height–bizygomatic index	7.07
5. Standing height	4.29	17. Ear length	7.09
6. Minimum frontal diameter–head breadth index	4.40	18. Upper facial height	7.13
7. Minimum frontal diameter–bizygomatic index	4.83	19. Nasal height	7.29
8. Minimum frontal diameter	5.00	20. Bigonial width	8.26
9. Total facial height	5.18	21. Ear breadth	8.59
10. Acromion to sole	5.32	22. Head height	8.81
11. Chest girth–sitting height index	5.39	23. Bigonial–bizygomatic index	9.05
12. Sitting height	5.44	24. Nasal index	9.15
		25. Ear index	9.40
		26. Upper facial height–bizygomatic index	9.53

For constancy in measurement head breadth stands first, with a low coefficient of variability, 3.27. Head length is almost as constant, and the cephalic index has also a low variability. The relationship of the sitting height to the standing height appears to be very constant (V=3.34).

In the group of coefficients of variation ranging from values 4 to 5 are standing height, minimum frontal diameter, and the indices derived therefrom. Of all facial measurements the minimum frontal diameter is the one most likely to be free from error, since the measurement is made between two well-defined bony crests over

TABLE II

INDICES FROM MEASUREMENTS OF FIFTY-THREE ADULT MALES OF THE OVIMBUNDU TRIBE, ELENDE, ANGOLA

No.	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
1	51.5	94.0	72.3	52.8	91.9	67.5	81.3	75.2	89.6	66.0
2	49.4	92.8	66.7	50.8	87.5	75.0	81.7	74.2	95.6	62.7
3	51.3	92.7	70.0	47.7	86.1	73.1	80.8	76.1	87.5	50.0
4	49.8	100.7	73.2	54.1	91.7	75.2	75.2	69.0	97.8	52.4
5	51.2	92.6	77.2	40.7	72.8	71.4	78.6	77.5	110.2	50.0
6	47.4	96.0	74.9	56.8	96.0	76.0	84.0	71.9	83.7	45.6
7	52.5	98.3	72.2	60.9	100.9	86.9	88.7	72.8	97.9	48.4
8	52.5	95.4	73.0	53.8	94.6	77.7	80.8	77.8	81.5	57.6
9	49.1	87.5	77.6	52.0	91.7	83.3	91.7	77.5	88.0	50.9
10	49.6	99.4	74.5	51.9	85.0	71.4	85.0	80.7	97.9	57.1
11	50.4	103.3	72.2	52.0	90.5	92.9	92.9	84.3	100.0	56.1
12	49.7	99.0	71.1	60.0	103.3	108.3	79.2	68.8	74.5	50.0
13	50.5	93.5	77.4	58.4	95.2	72.0	80.0	70.9	80.3	52.5
14	50.5	100.7	74.3	55.0	90.0	97.5	86.7	78.2	95.7	46.5
15	50.5	100.9	72.5	47.7	84.6	76.9	84.6	78.6	97.8	54.5
16	50.4	101.2	68.3	51.1	85.2	72.6	80.0	77.1	91.7	51.7
17	53.6	97.1	71.8	62.3	99.1	83.3	87.7	74.1	95.7	50.0
18	51.9	100.0	77.1	52.5	91.7	79.2	85.8	76.3	100.0	49.0
19	51.8	101.5	73.7	52.8	88.8	72.0	84.0	75.0	87.5	48.2
20	51.0	104.4	71.2	56.7	98.3	79.2	87.5	80.1	96.1	50.0
21	50.7	96.6	78.1	54.2	86.7	83.3	83.3	71.9	93.0	58.8
22	51.6	95.9	69.8	58.3	85.8	79.2	83.3	78.7	89.1	55.3
23	53.3	98.7	75.3	54.6	90.8	76.9	80.8	76.6	95.7	50.0
24	....	.....	75.4	49.6	85.2	74.1	79.2	75.9	84.0	50.0
25	50.8	89.3	71.3	58.3	93.9	82.6	86.9	74.6	76.0	49.1
26	53.0	89.2	77.5	57.7	94.8	86.2	87.9	73.9	88.9	66.7
27	51.3	100.9	77.8	64.3	104.3	86.9	86.9	69.4	78.7	58.8
28	49.9	.....	73.0	59.2	91.7	80.8	91.7	81.5	77.8	52.9
29	49.8	.....	70.7	59.2	93.6	92.0	83.2	74.3	72.7	56.2
30	51.3	98.8	75.1	72.5	114.7	93.1	95.1	74.6	82.0	50.0
31	49.7	100.0	73.4	54.2	91.7	83.3	85.0	72.3	95.7	53.8
32	50.3	96.6	70.5	52.0	91.2	80.0	84.0	78.3	86.3	50.0
33	51.3	99.5	70.7	54.4	92.0	74.4	84.0	77.8	86.5	55.8
34	47.2	98.0	71.4	60.9	94.5	81.8	81.8	72.0	91.1	60.0
35	48.1	98.1	71.9	61.0	100.0	78.0	89.0	78.9	85.4	56.4
36	49.1	.....	73.7	48.0	83.2	76.0	94.4	84.3	95.5	63.0
37	52.0	96.2	72.7	59.2	94.4	89.6	85.6	75.9	82.7	56.4
38	50.0	82.2	70.7	56.0	99.1	77.6	89.6	78.2	78.0	54.5
39	49.1	103.8	69.6	56.8	96.0	76.0	80.0	74.1	84.9	47.0
40	50.7	97.0	71.3	53.9	93.0	78.3	86.9	75.7	93.2	45.3
41	45.7	109.7	71.0	52.8	92.0	80.0	85.6	79.2	93.7	58.2
42	....	.....	71.8	55.2	94.8	77.6	86.2	74.1	82.0	53.8

which the flesh is thin. The bizygomatic also gives well-defined eminences; consequently, these measurements and the indices into which they enter are not likely to have a high variability because of difficulties of technique in measurement.

On the contrary, the bigonial width (V=8.26) may have a high variability because of the range of measurements resulting from a more or less fleshy jaw. It is difficult to say how accurately we are measuring the width between the bony gonial angles. Inspection of photographs (Plates I–XV) proves, however, that our figures of

TABLE II—*Concluded*

INDICES FROM MEASUREMENTS OF FIFTY-THREE ADULT MALES OF THE OVIMBUNDU TRIBE, ELENDE, ANGOLA

No.	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
43	50.7	92.6	74.0	64.0	100.8	84.0	88.0	74.3	81.8	56.1
44	45.8	107.9	76.1	47.5	90.2	77.9	90.2	80.3	70.2	57.4
45	51.5	91.5	74.2	59.2	93.3	79.2	83.3	74.1	86.0	46.4
46	50.9	94.0	72.3	60.0	96.7	75.0	85.0	76.7	87.2	57.8
47	51.4	90.2	74.3	65.0	101.7	79.2	83.3	76.9	87.0	54.0
48	48.1	97.3	74.5	56.7	101.7	79.2	87.5	75.0	89.4	51.7
49	47.9	107.5	74.1	61.6	94.4	76.0	89.6	80.0	84.6	61.2
50	49.2	.....	75.6	56.5	100.0	78.3	82.6	73.1	89.4	58.8
51	50.7	94.1	72.4	52.4	95.9	82.0	82.8	75.4	88.9	62.0
52	50.5	96.9	71.6	58.4	100.8	72.0	84.0	74.5	75.9	55.5
53	51.4	98.4	71.3	61.3	100.8	75.6	84.0	75.7	78.0	52.9
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
	(51)*	(47)	(53)	(53)	(53)	(53)	(53)	(53)	(53)	(53)
Means and errors	50.3 ±0.16	97.3 ±0.52	73.1 ±0.23	55.9 ±0.49	93.7 ±0.61	79.9 ±0.67	85.0 ±0.38	75.9 ±0.31	87.9 ±0.74	54.0 ±5.08
Coeff. of V.	3.34 ±0.22	5.39 ±0.37	3.45 ±0.23	9.53 ±0.62	7.07 ±0.46	9.05 ±0.59	4.83 ±0.32	4.40 ±0.29	9.15 ±0.60	9.40 ±0.55
Std. dev.	1.68 ±0.11	5.26 ±0.36	2.52 ±0.16	5.33 ±0.44	6.63 ±0.43	7.23 ±0.47	4.11 ±0.27	3.34 ±0.22	8.04 ±0.53	5.08 ±0.33

*Figures in parentheses indicate the number of men measured.

$$1 = \frac{\text{Sitting height} \times 100}{\text{Standing height}}$$

$$2 = \frac{\text{Chest girth} \times 100}{\text{Sitting height}}$$

$$3 = \frac{\text{Head breadth} \times 100}{\text{Head length}}$$

$$4 = \frac{\text{Upper facial height} \times 100}{\text{Bizygomatic}}$$

$$5 = \frac{\text{Total facial height} \times 100}{\text{Bizygomatic}}$$

$$6 = \frac{\text{Bigonial} \times 100}{\text{Bizygomatic (Jugomandibular)}}$$

$$7 = \frac{\text{Minimum frontal diameter} \times 100}{\text{Bizygomatic (Jugofrontal)}}$$

$$8 = \frac{\text{Minimum frontal diameter} \times 100}{\text{Head breadth}}$$

$$9 = \frac{\text{Breadth of nose} \times 100}{\text{Length of nose}}$$

$$10 = \frac{\text{Width of ear} \times 100}{\text{Length of ear}}$$

variability in facial measurements are no doubt genuine records of variability. There are many differences of facial contour, and the conclusion is that constancy of head form is accompanied by fairly high variability of facial measurements. The nasal index is in the highest ranges of variability (V=9+). On the whole the most entrenched features are proved to be head-form, stature, and the proportion of the trunk to the lower limbs.

A comparison of coefficients of variation is aided by inspection of Figures 4 to 11. These are graphs showing the frequency distribu-

tion of some of our measurements and indices. Compactness of a curve, which rests on a small base and rises to a peak without irregularities, is an indication of uniformity in the measurements, while, on the contrary, a straggling graph with a broad base, many irregularities, and a poorly defined modal peak indicates high variability in the measurements. Owing to paucity of data, class intervals are few and the curves show no more than general trends and modal values.

Considering that only 53 men were measured, one might suppose that the frequency distributions for all the traits would be somewhat irregular. On the contrary the curves are fairly compact, and those for distributions having a coefficient of variability of 3–4 are particularly well defined.

We are dealing with a sample from a restricted area in and about the small village of Elende, and, so far as the notes go, only one man married a woman from a distant place.

Only three men measured have brothers who were measured, and only four men have cousins (on their father's side) who were measured. I believe, therefore, that our sample, though perhaps tending to uniformity through local selection in marriage, is not appreciably influenced by measuring men who have a blood relationship.

Portuguese records show that the Ovimbundu have inhabited the high plateaus of central Angola during three centuries. The nature of the country tends to isolation, which would be an important factor in producing a uniform type. It is true that the Ovimbundu were caravan people who made long journeys eastward from central Angola; but the slaves, together with the ivory derived from these trading expeditions, were sold to the Portuguese, and in all probability there was little marital miscegenation of the Ovimbundu with slaves from far away.

We may, I believe, regard our sample as fairly representative of the Ovimbundu, who are tall, slim, dolichocephalic, Bantu-speaking Negroes. They are only moderately platyrrhine, and the skin colors range in the values medium brown to dark brown.

The anthropometric measurements of the Ovimbundu may now be compared with those taken by Cardoso (1916) among four neighboring tribes of eastern Angola.

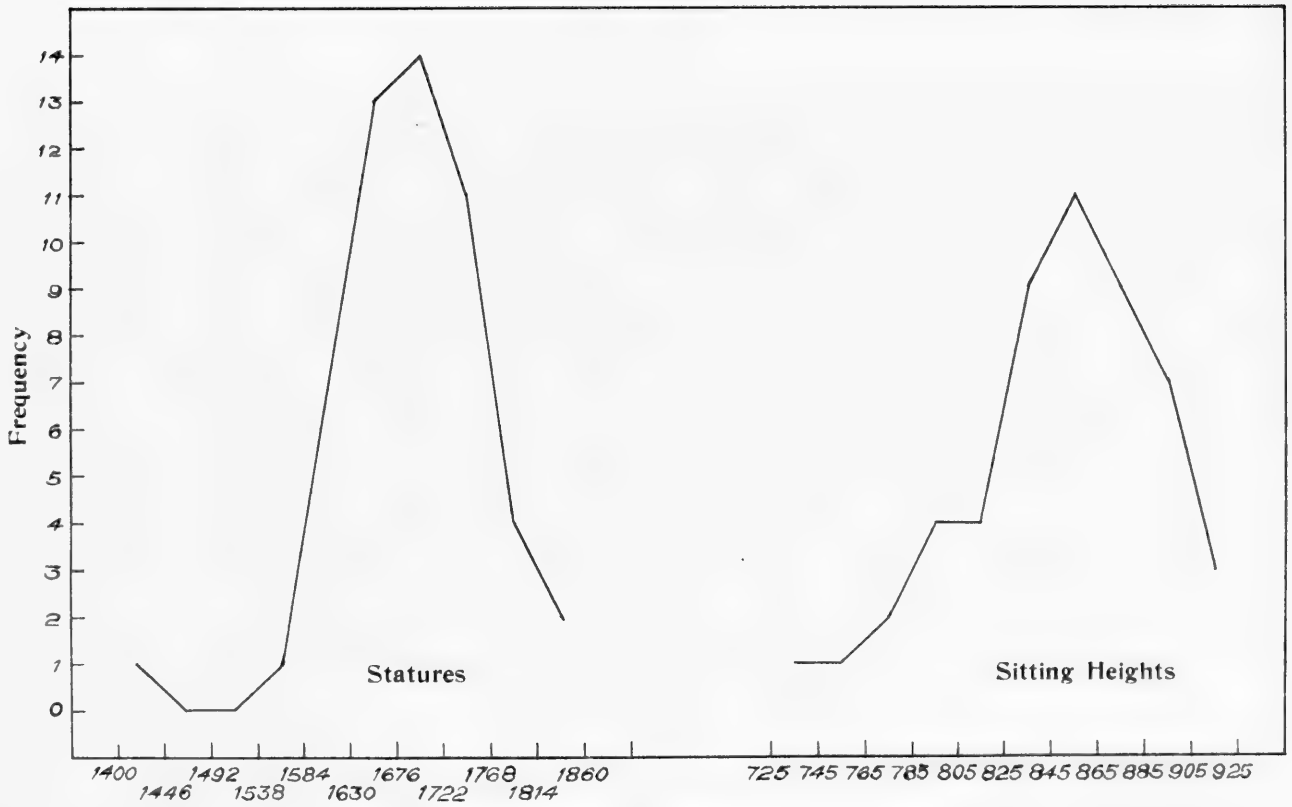

FIG. 4. Frequency distribution of statures and sitting heights.

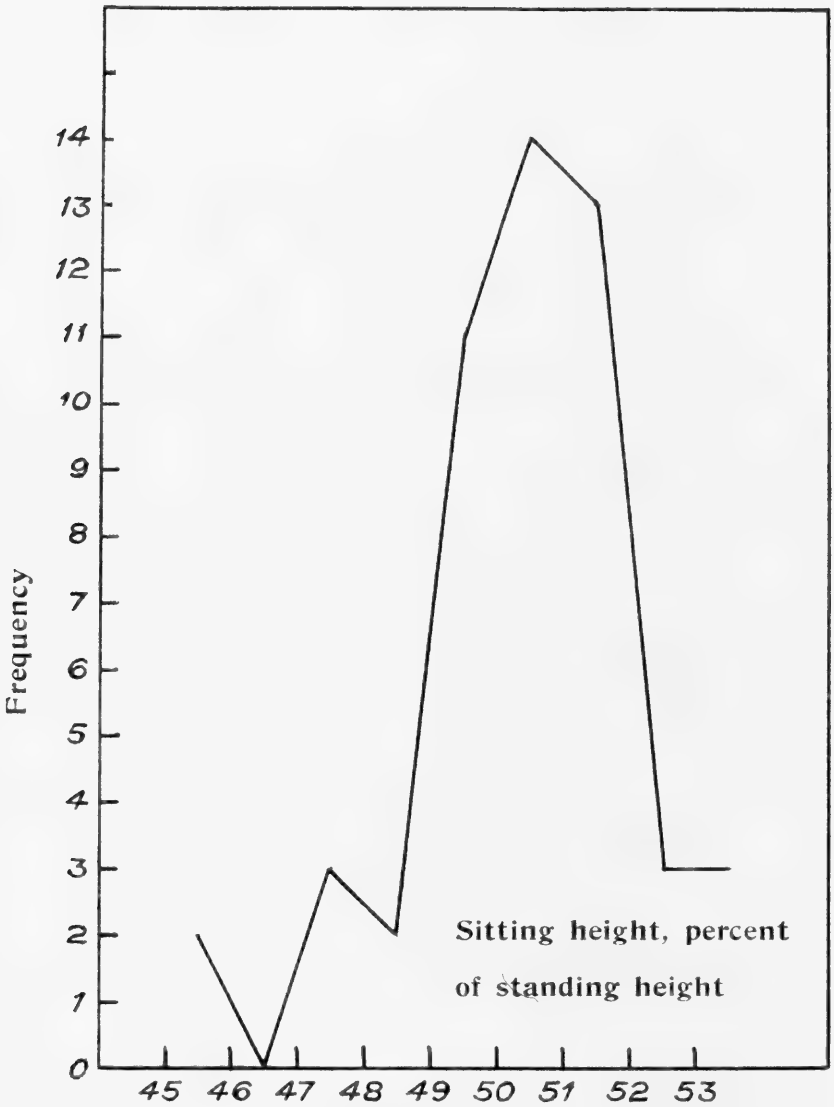

FIG. 5. Frequency distribution of sitting height as a percentage of standing height.

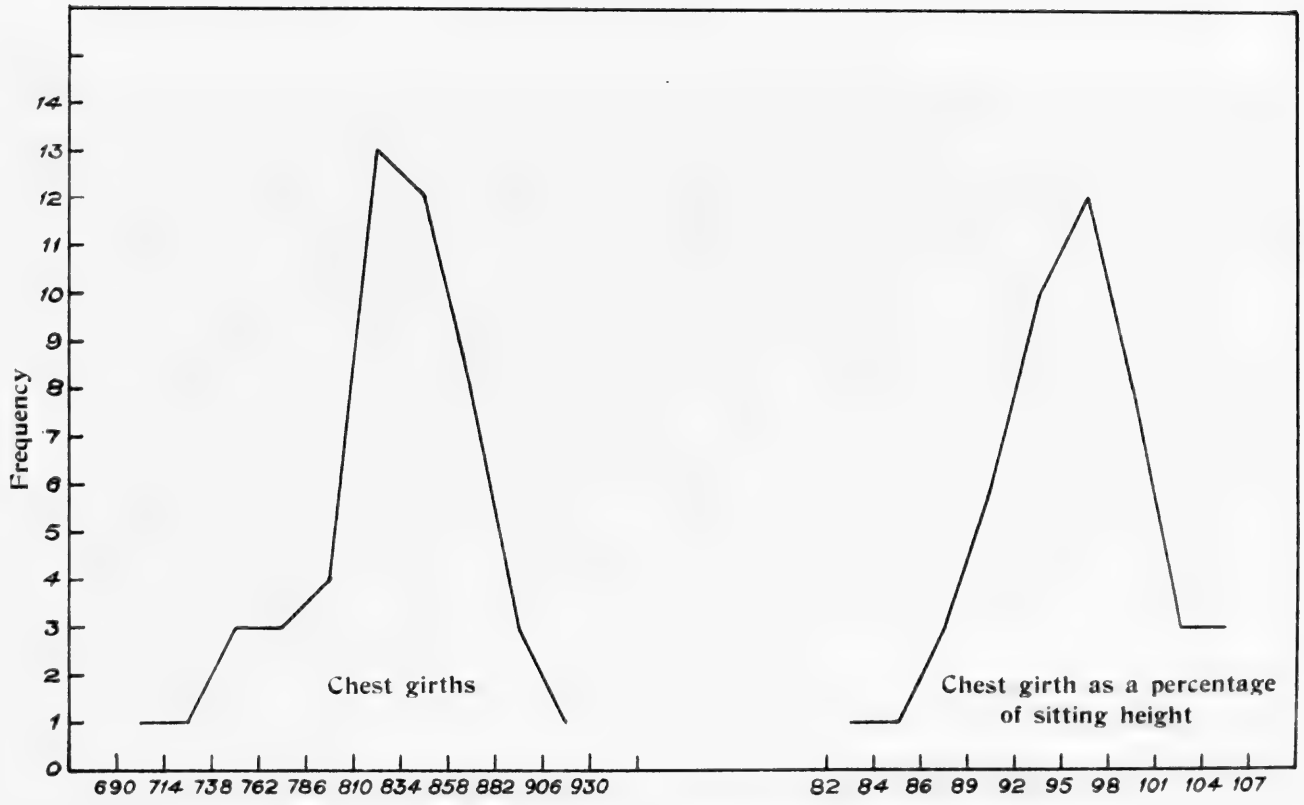

FIG. 6. Frequency distributions of chest girths, and chest girths as a percentage of sitting heights.

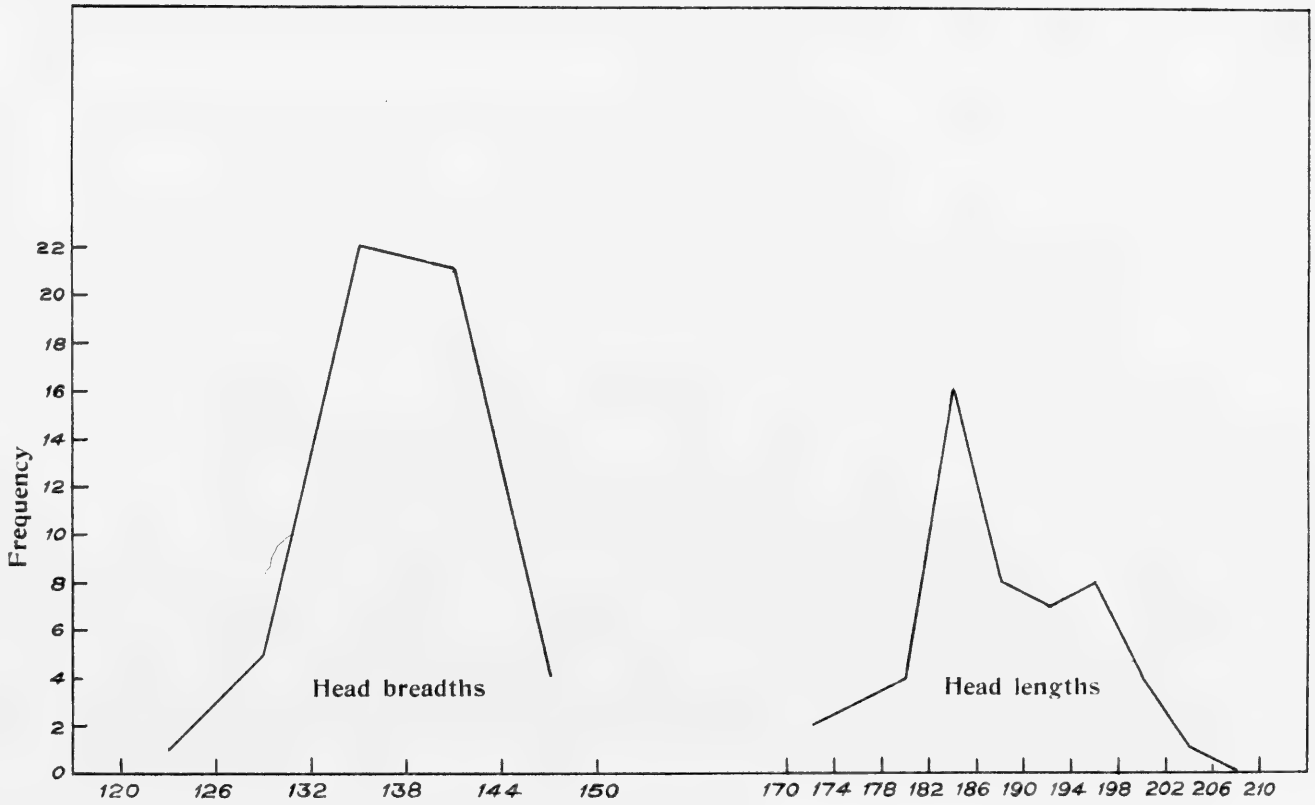

FIG. 7. Frequency distributions of head breadths and head lengths.

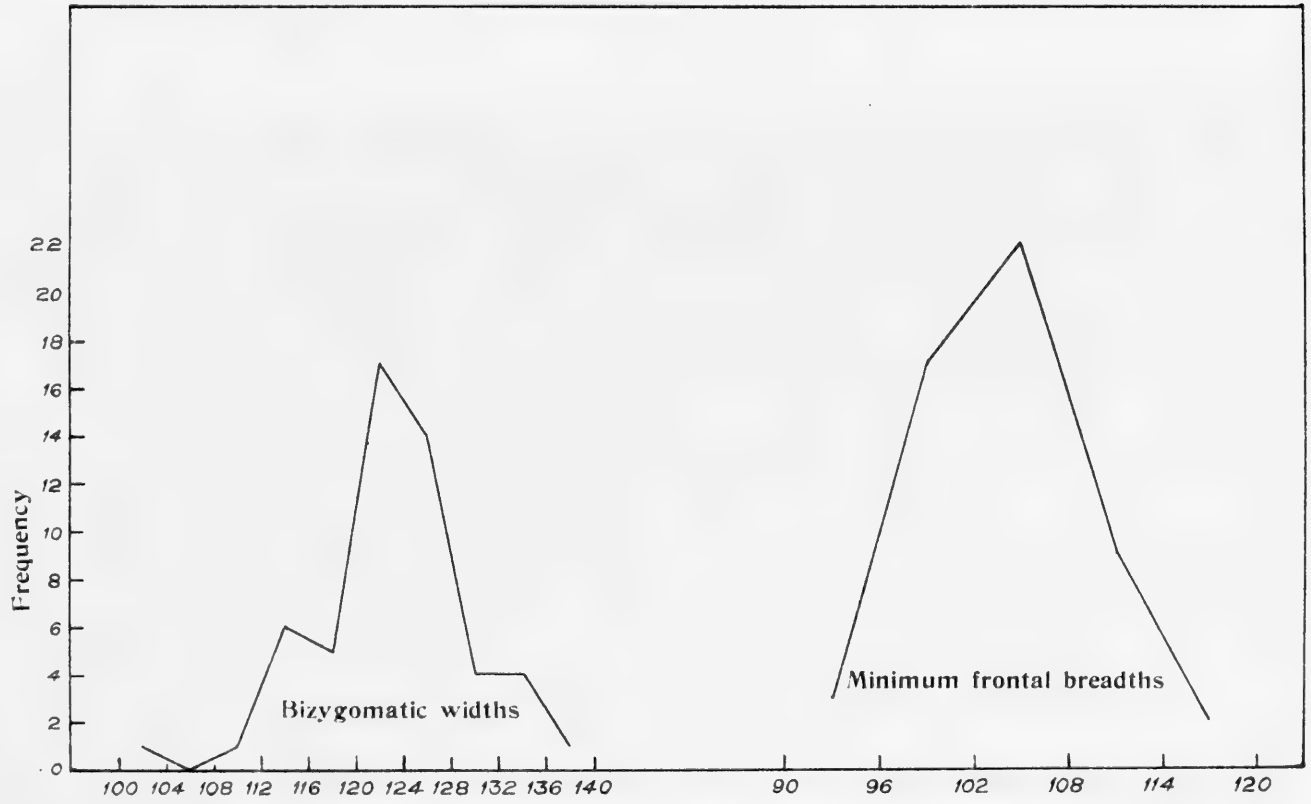

FIG. 8. Frequency distributions of bizygomatic and minimum frontal measurements.

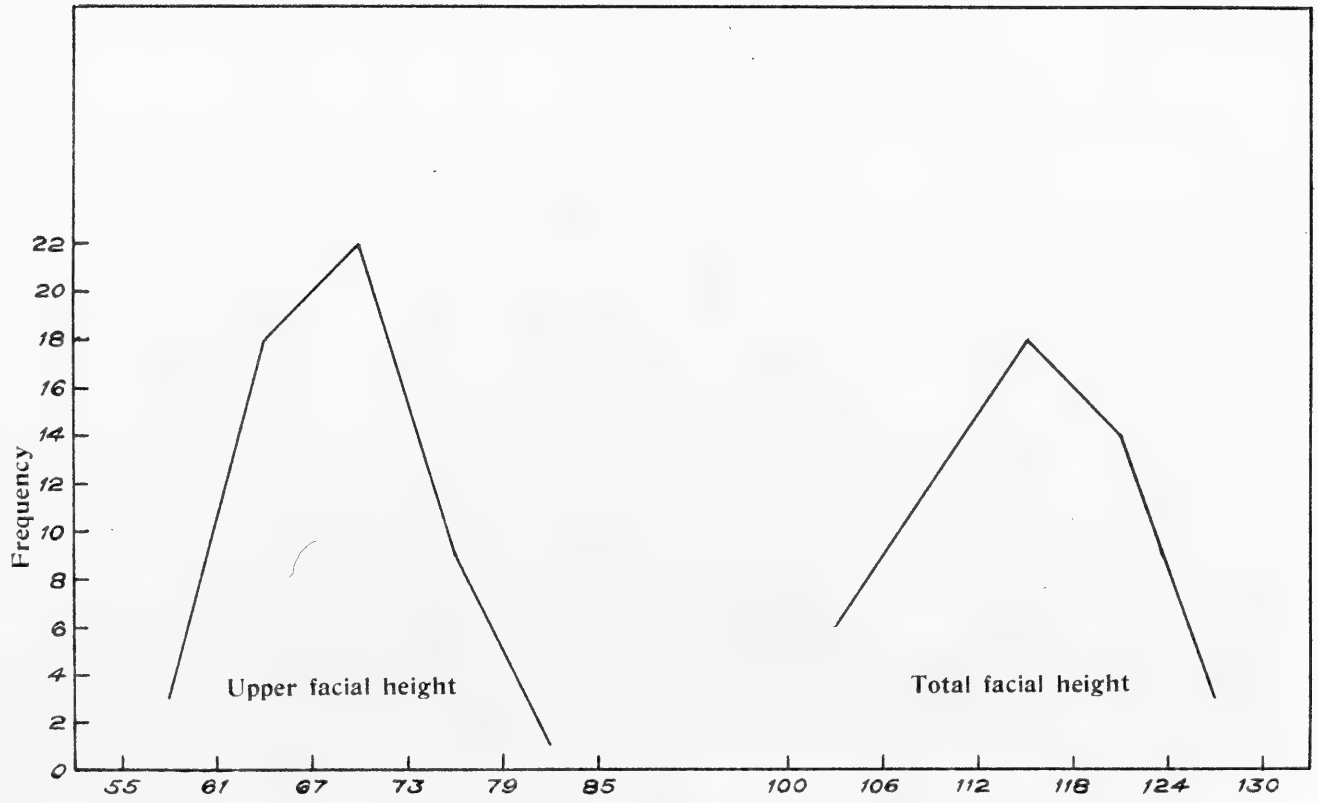

FIG. 9. Frequency distributions of facial heights.

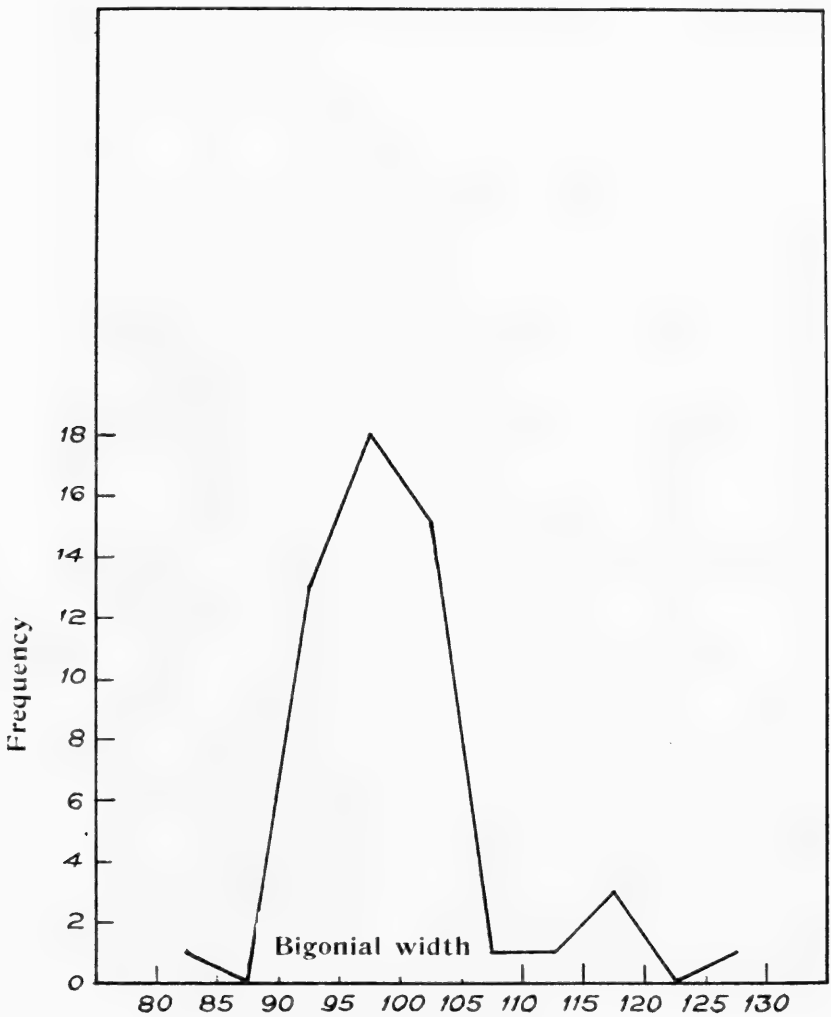

FIG. 10. Frequency distribution of bigonial widths.

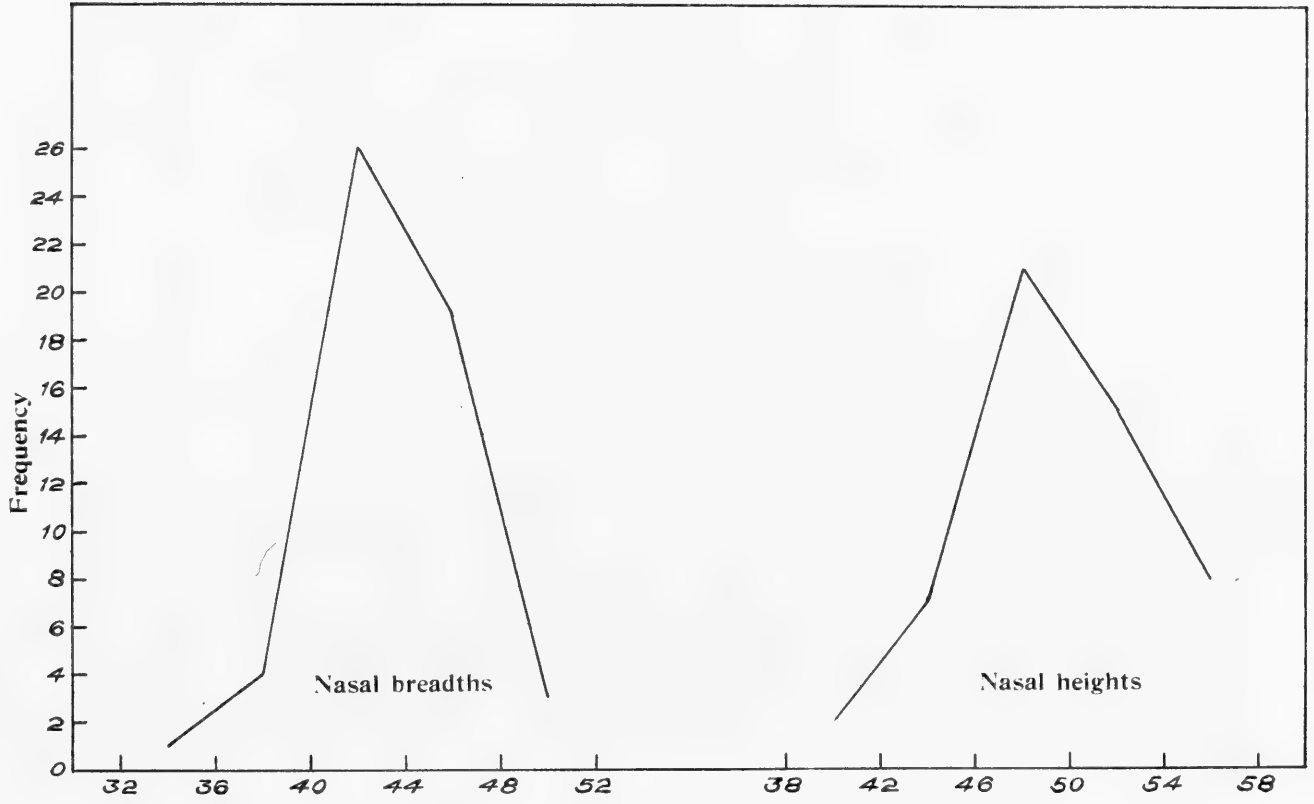

FIG. 11. Frequency distributions of nasal breadths and heights.

III. COMPARISON OF THE OVIMBUNDU WITH OTHER TRIBES OF ANGOLA

(Tables III–VI)

The only figures available for comparative study are those of Cardoso (1916), whose observations and measurements on males may be classified as follows:

Tribe and number measured	Habitat
Vachokwe (90)	8°–13° S. Lat. and 18.5°–22.5° E. Long.
Luimbe (82)	East of Kwanza River, between 11°–12° S. Lat. and 17°–18° E. Long.
Luena (101)	11°–12.5° S. Lat. and 20°–23° E. Long.
Luchaze (46)	About junction of meridians 19°–21° E. Long. and parallel 12.5° S. Lat.

Hambly (1934) gives a map showing the location of these tribes, as does Cardoso (1916, p. 256). The Ovimbundu are centrally situated, and the other tribes mentioned inhabit territory to the northeast, east, and southeast of the Ovimbundu.

The number measured is smallest for the Luchaze (46), then for the Ovimbundu, with observations on 53 men. The samples for the Vachokwe (90), the Luena (101) and the Luimbe (82) are more satisfactory. The series is, however, the only one available, so we are obliged either to reject the data, or to accept them with whatever defects there may be. Anthropometric measurements for the Ovimbundu are given in Table I and the indices for these measurements in Table II. The four tables for comparative study of the data collected for these tribes are Nos. III–VI.

Statures

(Tables III, IV)

The tallest people are the Luchaze, with an average height of 1704 mm. The Vachokwe are next, with a stature of 1695 mm., only 9 mm. less than the Luchaze. The Ovimbundu rank third, with an average height of 1687 mm., which is almost identical with the average stature for the Luena, namely, 1685 mm. The Luimbe are shortest, with a height of 1671 mm. With the exception of the Luimbe, whose stature is in the highest range of "medium" height, all the tribes are "tall," according to Seligman (1930, p. 12), who follows the system of grading and nomenclature adopted by A. C. Haddon.

TABLE III

COMPARISON OF AVERAGE MEASUREMENTS OF ANGOLAN TRIBES

(*In millimeters*)

Tribe	Stature	Cephalic index	Nasal index
Ovimbundu	1687	73.1	87.9
Vachokwe	1695	77.1	96.6
Luimbe	1671	75.6	98.6
Luena	1685	77.0	97.4
Luchaze	1704	75.1	98.5

The frequency distribution of the statures for five tribes is given in Table IV. This distribution has to follow the scheme of class intervals adopted by Cardoso, since he does not give measurements for individuals. If he had done so, we could have made our own class intervals.

All the tribes have a very small percentage of men in the class below 1600 mm., the range being 3.0 per cent for the Luena to 6.5 for the Luchaze. The class intervals, 1600–1649 mm., 1650–1699 mm., and 1700 mm. +, emphasize the superior height of the Luchaze, for whom more than half the sample is taller than 1700 mm. The Luimbe, who have the shortest average stature, show, as we might expect, the greatest number of individuals in the classes 1600–1699 mm. (medium height).

TABLE IV

PERCENTAGE FREQUENCY DISTRIBUTION OF STATURES

Class Interval	Tribes				
	Ovimbundu	Vachokwe	Luimbe	Luena	Luchaze
Less than 1600	3.8	3.3	6.1	3.0	6.5
1600–1649	22.6	16.7	25.3	23.8	19.6
1650–1699	34.0	35.6	31.9	29.7	19.6
1700+	39.6	44.4	36.3	43.5	54.3

The testimony of the distribution on the whole bears out the significance of the averages. The order of tallness is as follows:

According to averages	According to frequency distribution
Luchaze (tallest)	Luchaze
Vachokwe	Vachokwe
Ovimbundu	Luena
Luena	Ovimbundu
Luimbe	Luimbe

The only difference in the grading is that for the Ovimbundu and the Luena. According to averages the former (1687 mm.) are practically the same height as the latter (1685 mm.). There are, however, for the Luena 43.5 per cent in the tall class, but for the Ovimbundu only 39.6 per cent in that class. There are in the

Ovimbundu sample a few tall men whose exceptional height raises the average, but when classified according to stature frequencies there are not so many tall Ovimbundu as Luena.

CEPHALIC INDICES

(Tables III, V)

In comparative tribal study of this trait we have to recognize distinct differences of head form. Taking first the averages, the Ovimbundu with an average C.I. of 73.1 are decidedly the most dolichocephalic of our samples. Next come the Luimbe and the Luchaze, also dolichocephalic, with indices 75.6 and 75.1, respectively. These three tribes constitute a dolichocephalic group.

The remaining tribes, Vachokwe and Luena, have cephalic indices that are almost identical, 77.1 and 77.0 respectively; both are in the range of mesaticephaly.

The frequency distribution of cephalic indices (Table V) supports the inferences drawn from a study of averages. In the long-headed class (index 69–75) there are 77.3 per cent of the Ovimbundu sample, but less than half that number of the broader-headed Vachokwe and Luena. On the contrary, when we come to consider the tribal distribution in the mesaticephalic class interval 76–80 we find that the number of Ovimbundu in that class is only 22.6 per cent, while nearly three times as many (about 60 per cent) of the Vachokwe and Luena are in that class.

Again, in the class of broadest heads (index 81–85) there are no Ovimbundu whatsoever, but there are 10.9 per cent of Luena tribesmen, 8.9 per cent of Vachokwe, and 8.5 per cent of Luimbe. Every tribe except the Ovimbundu has representatives in the round-headed class.

TABLE V

PERCENTAGE FREQUENCY DISTRIBUTION OF CEPHALIC INDICES

CLASS INTERVAL	TRIBES				
	Ovimbundu	Vachokwe	Luimbe	Luena	Luchaze
69–75	77.3	30.0	50.0	29.7	54.3
76–80	22.6	61.1	41.5	59.4	39.1
81–85	....	8.9	8.5	10.9	6.5

NASAL INDICES

(Tables III, VI)

The list of average nasal indices for the five tribes (Table III) clearly indicates that our sample of Ovimbundu is distinctly more mesorrhine than any other tribal group. The average nasal indices for four tribes have a very small range, namely, from 96.6 for the

Vachokwe to 98.6 for the Luimbe. The nasal index for the Luchaze (98.5) is almost identical with that of the Luimbe, and the index for the Luena (97.4) is very close. So we have a homogeneous group of high nasal indices (96.6–98.6) for eastern Angolan tribes, but for the central Ovimbundu an index of only 87.9, about 10 points lower.

The frequency distribution (Table VI) brings out still more clearly the comparative narrowness of the nose in the Ovimbundu sample. In the mesorrhine class (N.I. 70–85) there are 35.8 per cent of the Ovimbundu sample, that is, five times as many as the Vachokwe, and seventeen times as many as the Luchaze, which have only 2.2 per cent of their sample in the mesorrhine class.

When we turn to the hyperplatyrrhine class interval (index 100+) we find only 5.7 per cent of the Ovimbundu sample present; but 50.0 per cent of the Luimbe, 53.3 per cent of the Luchaze, and similarly large numbers of the Vachokwe and the Luena are in the hyperplatyrrhine class.

TABLE VI

PERCENTAGE FREQUENCY DISTRIBUTION OF NASAL INDICES OF ANGOLAN TRIBES

CLASS INTERVAL	TRIBES				
	Ovimbundu	Vachokwe	Luimbe	Luena	Luchaze
Less than 70	....	....	....	....	....
70–84.9	35.8	6.7	4.9	6.0	2.2
85–99.9	58.5	55.5	45.1	51.5	44.4
100+	5.7	37.8	50.0	42.5	53.3

CONCLUSION

In stature the Ovimbundu are not greatly removed from tribesmen of eastern Angola. But, on the contrary, distinct differences of undoubted significance are seen in the cephalic and nasal indices. The Ovimbundu are decidedly long-headed and mesorrhine, when compared with their eastern neighbors.

The explanation of these differences may be geographical, historical, or biological. The central highlands, which are from 3,000 to 5,000 feet in elevation, have temperatures lower than those in surrounding country. Therefore the nasal index of the Ovimbundu inhabitants may be lower on this account (A. Thomson and L. H. D. Buxton, 1923). Moreover, isolation, leading to fixation of type, for both nose and head form, may be in some measure responsible for the distinctive characters of the Ovimbundu.

From tribal traditions, and from Portuguese sources, we know that the Ovimbundu have built up a strong isolated confederacy, which was at war with surrounding tribes for several centuries. The

Vachokwe, on the contrary, are known to have migrated from the southwest Congo region.

The historical evidence, together with the topographical conditions, points to close association of the four tribes—Vachokwe, Luimbe, Luena, and Luchaze—whose mesaticephaly and platyrrhiny are widely distributed traits of the Congo region. We have, therefore, in our samples: (1) A relatively round-headed, decidedly platyrrhine Congo group. This group consists of four tribes living close together in country offering no barriers to miscegenation. (2) A central, highland group of Ovimbundu, established earlier than the eastern tribes. These people have head form and a nasal index distinct from the eastern group of tribes.

IV. COMPARISON OF THE OVIMBUNDU WITH NEGRO TRIBES OUTSIDE ANGOLA

West Africa

(Tables VII, VIII)

The main samples for comparison are those of 100 west African Negroes measured by Weninger (1927), 100 Hausa measured by Tremearne (1911), and samples given by Herskovits (1937). Weninger's sample, though derived from several tribes, may be taken as representative of Negroes of Sudanic speech in the far west. The Hausa are a linguistic division of Negro affinities, but with some somatic modification. Their language is classed as Hamitic with Sudanic Negro elements. Compared with west African Negroes the Hausa show a refinement of features, including reduction in thickness of lips and width of nose.

Tremearne does not describe his technique, but he probably followed that of D. J. Cunningham (1909). Weninger adopted the technique of R. Martin (1928); so also did Herskovits, with certain modifications which he carefully describes (1930, pp. 19–39). I would say that the methods followed make comparisons permissible; but, even if objections are raised, we have no alternative data collected by the same observer using absolutely constant technique.

In stature, the Ovimbundu (1687 mm.) are almost identical with Weninger's sample, for which the average height is 1688 mm., a difference of only one millimeter. Tremearne's Hausa have an average height of 1684 mm., which differs very little from that of the Ovimbundu and Weninger's west African Negroes. The Ovimbundu are 45 mm. taller than the 48 Ashanti Negroes measured by Rattray (1923, p. 335).

Cephalic Index.—The Ovimbundu (index 73.1) are a little more dolichocephalic than Weninger's west African Negroes, whose index is 74.6, and a trifle higher still is the Hausa index of 75.4. The range for three tribes under comparison is therefore small, namely, 73.1–75.4. But Rattray's Ashanti have an index of 77.5 and are therefore distinctly more round-headed than the Ovimbundu.

Nasal Index.—The Ovimbundu (index 87.9) are definitely less platyrrhine than Weninger's west African Negroes, whose average N.I. is 92.9. With regard to the frequency distribution of nasal indices, only 5.7 per cent of the Ovimbundu are hyperplatyrrhine with an index of more than 100, but 27 per cent of Weninger's west

African Negro sample is hyperplatyrrhine. The Hausa, also, with an average N.I. of 90.0, are slightly more platyrrhine than the Ovimbundu. The nasal index of Rattray's Ashanti is 95.2, that is, 7.3 points higher than that of the Ovimbundu.

STATISTICAL COMPARISONS OF OVIMBUNDU, ASHANTI, AND DAHOMEANS

More precision can be given to comparative methods by determining whether the difference between the means is greater than three times the square root of the sum of the squares of the probable errors of the two averages:

$$M_1 - M_2 > 3\sqrt{(PE_1)^2 + (PE_2)^2}$$

Only in this case is the difference between the two means significant; otherwise, the difference might have arisen from random sampling.

TABLE VII

AVERAGE MEASUREMENTS OF THE OVIMBUNDU COMPARED WITH THOSE OF DAHOMEANS, ASHANTI, NIGERIANS, AND HERSKOVITS' "TOTAL WEST AFRICAN SERIES"

Traits	△ Ovimbundu Dahomeans	△ Ovimbundu Ashanti	△ Ovimbundu Nigerians	△ Ovimbundu West African series
Stature	+1.4	+34.2*	+15.9	+11.7
Sitting height	+11.6	+12.6	+4.9	+8.8
Head length	−6.2*	−1.9	....	−4.3*
Head breadth	−9.7*	−12.4*	....	−10.9*
Cephalic index	−2.7*	−5.7*	....	−4.0*
Upper facial height	+1.3	+3.2*	....	+0.9
Total facial height	−4.6*	−4.4*	....	−4.5*
Bizygomatic	−18.9*	−16.3*	....	−17.7*
Height of nose	−1.8*	−3.9*	....	−2.8*
Width of nose	−1.2*	−2.0*	−0.8	−1.3*
Height of ear	−4.6*	−3.1*	....	−3.9*
Width of ear	−4.7*	−5.1*	....	−4.9*

*△ = difference of averages. * = differences found to be significant. All figures in millimeters. Sign + or − to be read with the word Ovimbundu in front of it.*

Table VII gives average measurements of 53 Ovimbundu compared with averages of corresponding traits of 77 Ashanti and of 93 Dahomeans measured by Herskovits (1937). The significant differences are marked with an asterisk. R. A. Fisher (1932, p. 45) recommends the use of the standard error instead of the probable error. Students wishing to follow this system will divide the probable errors by 0.67449 to convert them to standard errors.

Ovimbundu and Dahomeans.—Nine of the twelve traits compared show a significant difference. The very small difference of 1.4 mm. in stature indicates that the Ovimbundu are almost exactly the same

average height as the Dahomeans. The differences in sitting height and in upper facial height are possibly real differences, though they are not proved to be so by the statistical methods we have used.

The head form of the Dahomeans is different from that of the Ovimbundu in three respects, namely, length, breadth, and cephalic index. The heads of the Ovimbundu are shorter, narrower (absolutely), and definitely more dolichocephalic than the heads of the Dahomeans.

The difference in bizygomatic breadth is significant; so also is the difference in total facial height, the dimensions of the nose, and the size of the ears. The Ovimbundu have narrower, smaller faces than the Dahomeans, their noses are narrower, and their ears are shorter and narrower.

Ovimbundu and Ashanti.—Ten out of twelve traits compared are significantly different. The Ovimbundu are very definitely taller than the Ashanti, and probably they have a greater sitting height, though the difference of 12.6 mm. is not demonstrably significant. Neither can we be sure that there is any real difference in head length, but we can be satisfied that the heads of the Ovimbundu are narrower (absolutely) and more dolichocephalic than those of the Ashanti. The Ovimbundu have a C.I. of 73.1, which is 5.7 units less than that of the Ashanti.

Herskovits (1937, p. 495) states that the Ashanti shape the skulls of infants to shorten them. This statement seems plausible because the Ashanti are round-headed, but it conflicts with the evidence given by Dingwall (1931, p. 113), whose collated references all mention elongation of the Ashanti head by artificial means.

The facial heights, both upper and total, are different in the Ovimbundu, who have also a significantly smaller bizygomatic width than the Ashanti. The Ovimbundu have ears that are definitely smaller than those of the Ashanti. In fact, the physiognomy of the two tribes is undoubtedly different.

Ovimbundu and West Africans.—Herskovits compounds his data for Dahomeans, Ashanti, and Nigerians into a "total west African series." In view of the significant differences, for example, in the head form of the Ashanti and Dahomeans, and because of the small number of groups, the compounding of traits may not be statistically permissible. There are few data for the Nigerians, and the "total west African series" results mainly from the averaging of measurements from only two units. The method is rather like averaging

the stature of two brothers, one of whom is 72 inches tall, the other 24 inches. The average height of the boys in the family is 48 inches.

It is desirable, of course, to have a general statistical basis for African Negroes, prepared from study of many groups whose average measurements are finely graded, as they might be if enough groups were measured. But, owing to paucity of data, perhaps the compounding of the few figures we have is permissible. In defense of averaging the data we may say that the three groups—Dahomeans, Ashanti, and Nigerians—are topographically close.

Differences between the average measurements of the Ovimbundu and the "total west African series" are given in the right-hand column of Table VII. In nine out of twelve instances of comparison the traits of the Ovimbundu are shown to be significantly different from corresponding traits of the west Africans. Possibly the Ovimbundu are taller than the west Africans, and the former may have the greater sitting height and upper facial height, though the plus values for the Ovimbundu are not demonstrably greater.

Summary.—In assessing the differences between somatic traits of the Ovimbundu and west Africans our consideration need not be entirely dependent on a mathematical test, though it is true that out of 39 calculations which test the differences of means, 28 are shown to be differences not likely to have arisen from comparison of small samples. In other words, they are probably real somatic differences.

But apart from such tests we may glance across the stature columns of Table VII and note that the Ovimbundu have always plus values in stature and sitting height. In every instance of comparison, the Ovimbundu have the shorter, the narrower, and the more dolichocephalic heads.

Upper facial height is always a plus value for the Ovimbundu, but the total facial height is always a minus value. These differences clearly indicate a difference in facial proportions, and this is further attested by the comparatively small bizygomatic width of the Ovimbundu. We have to admit, however, that measurements of facial heights, owing to poor definition of the points of measurement, are particularly liable to discrepancies when several different persons make the measurements.

A glance across the column giving dimensions of noses and ears shows these features to be smallest in the Ovimbundu.

Statistical data confirm photographic evidence in showing the Ovimbundu as a Negro type, but with modifications that distinguish them definitely from typical Negroes of far west Africa.

COMPARATIVE VARIABILITY OF OVIMBUNDU TRAITS AND THOSE OF OTHER WEST AFRICAN NEGROES

Table VIII has been prepared to facilitate comparison of variabilities. L. H. D. Buxton's figures in Rattray's "Ashanti" (1923) give coefficients of variation for traits of a small sample of 48 Ashanti. Herskovits (1937) gives standard deviations for measurements of 77 Ashanti and 93 Dahomeans. From the standard deviations, coefficients of variation have been worked out from the formula:

$$V = \frac{100\delta}{M}$$

The standard error of V is

$$\frac{V}{\sqrt{2N}}$$

which is converted to the probable error by multiplying by 0.674489.

The table should be consulted by glancing across from left to right. Evidently the variabilities of statures for the Ovimbundu, two groups of Ashanti independently measured, and the Dahomeans, are very close, all being within the zone V=3.37 to 4.29.

Sitting heights are a little more variable than statures but the coefficients are by no means high.

The head form in each tribal group has a low variability, and the variabilities are about the same for the four tribal groups considered. The dimensions of the head, likewise the cephalic indices, seem to be well-stabilized traits.

TABLE VIII

COEFFICIENTS OF VARIATION AND THEIR PROBABLE ERRORS, OF OVIMBUNDU TRAITS COMPARED WITH THOSE OF ASHANTI AND DAHOMEANS

Traits	53 Ovimbundu	48 Ashanti (Rattray)	77 Ashanti (Herskovits)	93 Dahomeans (Herskovits)
Stature	4.29±0.28	3.37±0.23	3.67±0.20	3.80±0.19
Sitting height	5.44±0.36	....	4.02±0.22	4.14±0.20
Head length	3.87±0.25	2.49±0.17	3.02±0.16	3.61±0.17
Head breadth	3.27±0.21	3.04±0.21	3.36±0.11	3.25±0.16
Minimum frontal diameter	5.00±0.33	3.78±0.26	....	....
Bizygomatic	5.60±0.37	3.18±0.22	4.06±0.22	3.40±0.17
Bigonial breadth	8.26±0.54	5.16±0.36	....	....
Upper facial height	7.13±0.47	7.47±0.52	6.44±0.35	6.21±0.30
Total facial height	5.18±0.34	5.42±0.41	4.82±0.26	5.50±0.27
Nasal height	7.29±0.48	5.49±0.38	7.62±0.41	7.30±0.36
Nasal breadth	6.39±0.45	7.54±0.52	7.16±0.39	7.42±0.36
Ear breadth	8.59±0.56	....	7.37±0.40	6.92±0.34
Ear length	7.09±0.46	....	7.03±0.38	7.63±0.38
Cephalic index	3.45±0.23	3.18±0.22	3.13±0.17	4.34±0.21
Nasal index	9.15±0.60	9.87±0.69	....	....
Upper facial index	9.53±0.62	7.03±0.49	....	....
Total facial index	7.07±0.46	5.07±0.35	....	....

The highest variabilities are shown in the nasal index and the upper facial index; for the former the V value is in the 9+ zone.

On the whole, the conclusion must be that despite real differences in *absolute* measurements, the variabilities of the traits for different tribal groups are remarkably close, trait for trait. We are dealing with distinct somatic types and tribal differences. But the groups are equally well stabilized, and in each tribal group head form and stature seem to be the physical features which are most strongly entrenched and least variable.

THE CONGO REGION

Stature.—Figures collated by Montandon (1928, pp. 243, 264, 276) and by Hambly (1937, p. 173) show that most of the Congo tribes are of medium stature, that is, somewhat shorter than the Ovimbundu, who are upper medium to tall. Yet the Ovimbundu (1687 mm.) are shorter than the Bushongo (1747 mm.) and also shorter than the Azande (1701 mm.).

Cephalic Index.—The data for head form (Struck, 1922) are more convincing. Negroes of the Congo are definitely in the higher ranges of mesaticephaly with indices from 77 to 80, whereas the Ovimbundu are decidedly dolichocephalic (index 73.1).

Nasal Index.—From the same collations of statistics, though these are not as reliable as one might wish, one may make some comparisons with tribes in the Congo region. Montandon (1928, p. 243) gives 47 averages of nasal indices for different tribes. The averages do not carry equal weight, for they are not based on equal numbers of observations. In some samples there is paucity of data; neither can we be sure of the technique of the many observers whose results are collated by Montandon.

Nevertheless, the frequency distribution of the 47 average indices shows that 16 of them have a value from 90–105. That is to say, one-third of the samples from the Congo are definitely platyrrhine and hyperplatyrrhine. About one-third of the Congo samples fall in the class interval 85–90, and to this value the N.I. 87.9 of the Ovimbundu conforms. Montandon's collation shows 10 of the 47 average indices to lie in the range 80–85, which is somewhat more mesorrhine than the value for the Ovimbundu.

Apparently, when the nasal index for the Ovimbundu is compared with a series of 47 average nasal indices for Congo tribes the N.I. of the Ovimbundu occupies an intermediate position. One-third of the Congo samples are more platyrrhine than the Ovimbundu, one-

third have about the same degree of platyrrhiny, and one-third are less platyrrhine than the Ovimbundu.

We have, however, only one definite and reliable fact emerging from comparison of the Ovimbundu with the Congo tribes; namely, the dolichocephaly of the Ovimbundu and the high mesaticephaly of most Congo tribes. Undoubtedly the Congo region was formerly more widely and more densely populated with Pygmy tribes than at present. Miscegenation of Negroes and Pygmies takes place today, and this process, continued over many generations, probably accounts for the low-medium stature and the comparatively round-headed form of many Negro tribes of the Congo region.

SOUTH AFRICA

Stature.—Dr. C. G. Seligman (1930, p. 189), quoting from a manuscript by Turner in the Royal Anthropological Institute, London, states that a miscellaneous group of 4,098 Negro mine laborers of adult age had an average stature of 1670 mm. This is 17 mm. less than the average stature of our sample of Ovimbundu.

Stayt (1931, pp. 11, 368–371) shows the average stature of 168 Bavenda males to be 1676 mm., which is 11 mm. shorter than the average for the Ovimbundu. But the 39 Zulu (1696 mm.) and the 23 Batonga (1712 mm.), measured by Cipriani (1930–31), are both appreciably taller than the Ovimbundu.

Cephalic Index.—Consulting the same sources, we find that the C.I. for 168 Bavenda is 75.2; that is, two points higher than the head index for the Ovimbundu. The index for the Zulu is 75.4, again just a little higher than that of the Ovimbundu. The 23 Batonga have a C.I. of 72.3. They are just a trifle more dolichocephalic than the Ovimbundu. Yet, on the whole, the C.I. of 73.1 for the Ovimbundu makes a good fit with the indices for the Bavenda, the Batonga, and the Zulu.

Nasal Index.—All the average nasal indices given by Stayt, and by Cipriani, are higher than the index of 87.9 for the Ovimbundu. The Bavenda have an index of 92.3, the Zulu 92.0, and the Batonga 90.9. The Ovimbundu are less platyrrhine than these samples of southeastern Negroes.

EAST AFRICA

Stature.—Samples of measurements from east Africa are numerous (Hambly, 1937, p. 178) but open to the objections previously stated. Roscoe (1911, p. 520) gives the average height of 288 Baganda as 1673 mm. That is 14 mm. shorter than the average for

the Ovimbundu. Scanning down a list of statures of 16 tribes (Hambly's compilation) shows the Ovimbundu to have the highest average. The 101 Wanyamwezi of Leys and Joyce (1913) have an average stature of 1675 mm., almost the same as that of the Baganda, but 12 mm. shorter than the average for the Ovimbundu.

Cephalic Index.—The C.I. of the Ovimbundu (73.1) is almost identical with that of 288 Baganda, who have an average index of 73.4. The index for the Ovimbundu agrees well with the samples of average indices for east African Negroes. These samples have a small range of averages, the extremes being 72.6 to 77.6, and the modal value of the averages is about 74.0.

Nasal Index.—Roscoe's 288 Baganda have an average N.I. of 85.4, slightly less platyrrhine than the index of 87.9 for the Ovimbundu. The 128 Akamba measured by Leys and Joyce (1913) have an index of 86.5, which is between that of the Baganda and the Ovimbundu, but all three indices are in a very small range. Hambly's "Source Book" (1937, p. 178) shows that the average nasal indices for tribes in lower east Africa range from 89.4 to 101.1. All the samples, eleven in number, are appreciably more platyrrhine than the Ovimbundu.

CONCLUSION

In stature the Ovimbundu may be matched by many Negro tribes. The cephalic index of 73.1 is of a dolichocephalic type that is common, except in the central Congo and part of Cameroons, where high mesaticephaly prevails. The Nilotic Negroes are definitely taller than the Ovimbundu, more dolichocephalic, with an index about 70–72, and decidedly more platyrrhine.

The Ovimbundu agree well in stature with tribes of eastern Angola but are definitely less platyrrhine and more dolichocephalic.

The most interesting feature recorded for the Ovimbundu is the nasal index, which is in close agreement with the indices of adequate samples of the northeastern Bantu, namely, Baganda and Akamba.

The series of photographs (Plates I–XX) shows the slim build of the Ovimbundu as compared with typical west African Negroes. In comparative narrowness of nose, reduced width of face, reduced thickness of lips, modified prognathism, and comparatively light skin color the Ovimbundu must be regarded as a modification of the true Negro of the Kru and Ibo type.

The general build and physiognomy of the Ovimbundu together with the nasal index suggests a contact, perhaps very remote in time,

with that northeast African element that is usually described as Hamitic. But perhaps the modified Negro characters of the Ovimbundu may be due, not to interbreeding of types, but to isolation under definite environmental conditions.

V. SIZE OF FAMILIES AMONG THE OVIMBUNDU
(*Table IX*)

Difficulties of Inquiry

An effort to discover the age of each speaker, the age at which he was married, and the number of years married was a failure. Ngonga, the interpreter, also Dr. M. W. Ennis and Dr. Hollenbeck, made estimates for a few individuals who were well known to them, but the information obtainable was too uncertain to be used statistically. There did seem, however, to be some indication that a youth marries at the age of about twenty-two to twenty-five years. Subjects seemed willing to answer, but some had evidently forgotten the exact number of their brothers and sisters, since some of these had died in very early infancy. Aversion to speaking of the dead may have made our estimated death rate too low. The range of ages may be considered to be from twenty to forty-five years, and this point is of importance when considering the incidence of mortality.

Brothers and Sisters of the Informants

To carry out this inquiry satisfactorily the investigator would have to know not only the number of brothers and sisters, living and dead, but many more details of the family structure. Was the family polygynous? If so how many wives constituted the family? How many children of each sex did each wife bear? What was the survival among these children? Was one father responsible for the parentage of all the children enumerated by the speaker? A few inquiries showed that such a questionnaire was far too ambitious, and the only information obtained was that tabulated in Table IX, showing brothers living and dead, sisters surviving and dead, together with totals. These figures I believe to be sufficiently reliable for consideration, yet any inferences we draw are only approximations to the truth. For example, a subject of twenty-two years may have a father who is still young enough to beget children by existing wives or by newly acquired spouses. Therefore, by recording the *present* size of the family we may be underestimating. We must not forget, of course, to add the speaker himself to the number of brothers and sisters he enumerates. The difficulties of inquiry are such that the technique demanded in communities where written records are kept cannot be applied to the Ovimbundu.

Brothers.—Fifty informants claim 83 living brothers, so making a total of 133 males, that is, 2.7 living males for each family. For

TABLE IX

Size of Families

No.	Age*	Marriage		Brothers and Sisters							Children						
		Probable age at marriage	Years married	Brothers		Sisters		Brothers and sisters			Boys		Girls		Boys and girls		
				Living	Dead	Living	Dead	Living	Dead	Total	Living	Dead	Living	Dead	Living	Dead	Total
1	36	25	11	1	2	1	3	2	5	7	1	5	0	0	1	5	**6**
2	24	22	2	1	2	1	3	2	5	7	1	0	1	0	2	0	**2**
3	29	24	5	3	0	1	2	4	2	**6**	1	1	1	0	2	1	**3**
4‡	45	25	20	0	?	0	?	0	?	**?**	7	2	7	0	14	2	**16**
5	24	21	3	2	2	2	2	4	4	**8**	1	0	1	0	2	0	**2**
6†	28	23	5	?	?	?	?	?	?	**?**	1	1	1	0	2	1	**3**
7	45	20	25	0	2	0	2	0	4	**4**	4	5	3	5	7	10	**17**
8	?	?	?	1	1	0	0	1	1	**2**	0	3	2	3	2	6	**8**
9	21	unmarried		2	?	1	?	3	?	**3**	0	0	0	0	0	0	**0**
10	25	not long married		1	1	2	0	3	1	**4**	1	0	0	0	1	0	**1**
11	34	?	?	9	0	0	0	9	0	**9**	2	0	2	0	4	0	**4**
12	35	?	?	0	0	0	5	0	5	**5**	1	3	2	2	3	5	**8**
13	50	?	?	0	7	1	0	1	7	**8**	1	2	4	1	5	3	**8**
14‡	?	?	?	0	1	0	1	0	2	**2**	0	0	0	0	0	0	**0**
15‡	?	?	?	0	?	0	3	0	3	**3**	0	0	0	2	0	2	**2**
16	?	?	1	1	0	1	1	2	1	**3**	0	0	0	0	0	0	**0**
17	25	?	?	0	0	0	2	0	2	**2**	1	0	0	1	1	1	**2**
18	?	unmarried		2	0	1	2	3	2	**5**	0	0	0	0	0	0	**0**
19	?	?	?	0	2	0	2	0	4	**4**	0	2	1	1	1	3	**4**
20	?	?	?	0	4	0	3	0	7	**7**	0	1	3	1	3	2	**5**
21	?	unmarried		1	0	1	1	2	1	**3**	0	0	0	0	0	0	**0**
22	20	unmarried		5	0	0	0	5	0	**5**	0	0	0	0	0	0	**0**
23	26	?	?	1	4	2	3	3	7	**10**	2	0	0	0	2	0	**2**
24	?	?	?	2	2	2	1	4	3	**7**	0	1	3	0	3	1	**4**
25	?	?	?	1	0	2	1	3	1	**4**	1	0	1	2	2	2	**4**
26	21	unmarried		2	0	4	1	6	1	**7**	0	0	0	0	0	0	**0**
27†	50	?	?	?	?	?	?	?	?	**?**	3	0	1	0	4	0	**4**
28	27	?	?	5	5	1	0	6	5	**11**	1	1	1	0	2	1	**3**
29¶	28	?	?	5	1	3	0	8	1	**9**	0	2	2	0	2	2	**4**
30	?	?	?	0	1	1	2	1	3	**4**	3	0	3	0	6	0	**6**
31	30	?	?	2	4	1	0	3	4	**7**	1	0	1	0	2	0	**2**
32	?	?	?	0	4	1	1	1	5	**6**	0	0	0	0	0	0	**0**

TABLE IX—*Continued*

SIZE OF FAMILIES

No.	Age*	MARRIAGE		BROTHERS AND SISTERS							CHILDREN						
		Probable age at marriage	Years married	Brothers		Sisters		Brothers and sisters			Boys		Girls		Boys and girls		
				Living	Dead	Living	Dead	Living	Dead	Total	Living	Dead	Living	Dead	Living	Dead	Total
33	25	?	?	2	0	3	1	5	1	**6**	1	0	1	0	2	0	**2**
34‡	16	unmarried		3	?	0	?	3	?	**3**	0	0	0	0	0	0	**0**
35	25	?	?	2	0	1	2	3	2	**5**	0	0	0	0	0	0	**0**
36	28	unmarried		2	3	1	1	3	4	**7**	0	0	0	0	0	0	**0**
37	25	?	?	2	0	0	3	2	3	**5**	1	0	4	0	5	0	**5**
38	50	?	?	0	0	0	2	0	2	**2**	0	1	0	2	0	3	**3**
39‡	?	?	?	?	?	?	?	?	?	**?**	3	0	1	2	4	2	**6**
40	45	?	?	2	2	0	2	2	4	**6**	1	1	2	0	3	1	**4**
41	25	?	?	3	2	0	0	3	2	**5**	1	0	0	0	1	0	**1**
42	24	?	?	1	3	2	3	3	6	**9**	0	0	0	0	0	0	**0**
43	?	?	?	1	0	0	1	1	1	**2**	2	1	1	1	3	2	**5**
44	?	unmarried		1	0	2	3	3	3	**6**	0	0	0	0	0	0	**0**
45‡	?	unmarried		1	?	2	?	3	?	**3**	0	0	0	0	0	0	**0**
46	?	?	?	4	0	4	0	8	0	**8**	1	0	2	1	3	1	**4**
47	45	?	?	2	1	1	0	3	1	**4**	1	1	0	0	1	1	**2**
48	40	?	?	0	4	1	0	1	4	**5**	0	2	1	0	1	2	**3**
49	20	unmarried		4	0	4	0	8	0	**8**	0	0	0	0	0	0	**0**
50	25	?	?	1	0	0	0	1	0	**1**	0	0	0	1	0	1	**1**
51	30	?	?	4	3	0	0	4	3	**7**	0	0	1	0	1	0	**1**
52	?	?	?	0	0	2	3	2	3	**5**	0	0	0	1	0	1	**1**
53	?	?	?	1	0	0	0	1	0	**1**	0	0	0	0	0	0	**0**
Totals				(50)|| 83 (133)	63	(50) 52	62	(50) 135 (185)	125	(50) **260** (310)	(43) 44	(43) 35	(43) 53	(43) 26	(43) 97	(43) 61	(43) **158**
Averages				2.7	1.3	1.0	1.2	3.7	2.7	6.2	1.0	0.8	1.2	0.6	2.2	1.4	3.7

* Approximate.

† Unable to answer.

‡ Other brothers and sisters deceased, some in early infancy; informant unable to remember details, especially when deaths occurred before his birth.

¶ Wife from Lunda.

|| The figure in parentheses gives the number of informants. Thus, 50 informants claim 83 living brothers, so making a total of 133 living males for the 50 families, or 2.7 living males per family.

Similarly in column seven from the left, 50 informants claim 260 brothers and sisters (living and dead). This number (260) plus the 50 informants gives a total of 310 children for the 50 families, or 6.2 children (living and dead) per family.

each of these families there are 1.3 deceased males, so making a total male progeny of 4.0 per family. Since the male issue is 133 living, and 63 dead, the total male progeny is 196, which gives a death rate of 32.1 per cent for males.

Sisters.—The group of 50 informants has 52 living sisters, which gives an average of 1.0 living girls per family, and since 62 girls have died there is a death rate of 1.2 girls per family. Out of a total of 114 girls born, 62 died, so giving a death rate of 54.4 per cent as compared with a death rate of 32.1 per cent for boys. More boys than girls are born, according to these family records, and the males survive better. Death rates should, of course, be given in age groups. All we can say is that our informants varied from 20 to about 45 years, and that the deaths recorded are those of individuals from infancy to about 45 years of age.

We must remember that our vital statistics are not dealing with mortality in infancy or childhood only. In fact, an informant usually forgets the infantile mortality, but he remembers his contemporaries, and his figures certainly include those of his sisters who died in childbirth. Probably deaths in childbirth account for the higher mortality among females.

Brothers and Sisters.—Our informants represent a total family strength of 310 children living and dead, that is, about 6.2 children per family. The word family is used in the restricted sense to mean the father, his wife or wives, and their children. In polygynous families each wife has her own hut in the family compound, and in this hut she resides with her children. There she keeps house and is visited by her husband in a four-night cycle. We have, therefore, a picture of the father and mother (or mothers) with an average of 6.2 children to the family compound. This is, of course, a high average compared with European standards.

Of these 310 children 185 survived and 125 died, which gives a high death rate of 40.3 per cent. Considering that we have not included infants who died very young, and whose numbers are not remembered by the informants, the mortality is probably higher than our data suggest.

CHILDREN OF INFORMANTS

Examination of the section of Table IX dealing with children of the informants should provide a check on the conclusions derived from that part of the same table which gives statistics for brothers and sisters.

We are dealing now with the families of 43 married men, but the total number of children per family will not be strictly comparable with the family strength as revealed by an inquiry about brothers and sisters. Many of our married subjects are in the early twenties, and we cannot forecast the number of their progeny. Some informants have been married only a year or two. On the contrary, when our informants speak of their brothers and sisters, they are giving a fairly complete and reliable idea of family strength, for each informant is of adult age. This explanation perhaps accounts for the fact that the family, judged from the number of brothers and sisters, was 6.2, and only 3.7 as judged from the number of children of the informants.

Male Children Surviving.—The informants have a male progeny of 79, of whom 35 have died. The death rate for boys is therefore 44.3 per cent, or somewhat higher than the 32.1 per cent calculated from information respecting births and deaths of brothers.

Female Children Surviving.—The informants have a female issue of 79, which is exactly the same as the male progeny. Of the 79 females born, 26 died, so giving a mortality rate of 32.9 per cent. This is appreciably less than the 54.4 per cent death rate calculated from information respecting brothers and sisters.

Male and Female Children Surviving.—The total number of children begotten by our 43 informants is 158, of whom 61 have died, so giving a death rate of 38.6 per cent. This is a close approximation to the 40.3 per cent death rate arrived at by studying deaths of brothers and sisters.

CONCLUSION

The only permissible inferences are:

(1) That, judged by European standards, the families are large.

(2) That, though the birth rate is high, this is balanced by a high death rate. The death rate for the brothers and sisters of the informants was 40.3 per cent of all births, and for children of the informants the general death rate was 38.6. These figures are in close agreement, and since the data are derived from two independent methods of inquiry I think we may be fairly confident that the death rate is about 40 per cent. The difference of −1.7 per cent in the death rate of children as compared with those of the older generation (brothers and sisters columns, Table IX) may be the result of an improvement in medical attention following the erection of government hospitals and missionary medical stations. The

difference is so small, however, that it might arise fortuitously from the crude methods of our census.

(3) Data relating to the children of our informants indicate that the birth rates for boys and girls are exactly equal. Our 43 informants sired 79 boys and 79 girls. But the inquiry respecting brothers and sisters indicates a definite preponderance of male births. The figures indicate a change in sex ratio at birth, from one generation to the next.

(4) Evidence respecting the relative survival of boys and girls is contradictory. The brothers and sisters inquiry shows the death rate of girls as 54.4 per cent, and that for boys as 32.1 per cent. On the contrary, among children born to our informants the death rate for boys is 44.3 per cent, and that for girls is 32.9 per cent. The death rates for both sexes together are, however, very close, namely, 40.3 per cent for the brothers and sisters generation, and 38.6 for the children of our informants.

(5) Students wishing to make further study of sex ratios and death rates of males and females at all ages will find a bibliography of sources in Hambly's compilation (1937, pp. 691–694). L. W. G. Malcolm (1924, pp. 454–473) adduces some evidence to show that masculinity can be higher at birth and in early years among Negroes, for example, the Ibo and the Edo. We have, however, to beware of errors that might arise from a discriminating infanticide that favored the preservation of boys. And when dealing with adults there is a discriminatory emigration to be reckoned with. The subject of census returns is full of pitfalls.

P. Ryckmans (1933, pp. 242–258) adduces some evidence to show a preponderance of males at birth in one of the Congo regions, but the number of females is usually in excess of the number of males at birth. Except in one province, the females of the first year survive better than the males.

Ryckmans points out that boys of fifteen years of age are more numerous than girls in the provinces studied. But, in the absence of written records and accurate time-keeping, the age of fifteen has to be judged by the investigator. There is a definite tendency to bias the results by classing well-developed girls as adult women even though they may be only fifteen years of age or under. The same error is not so likely to be made when judging the age of boys. The tendency, therefore, is to get too many boys, and too few girls in the fifteen-year age group.

The sex ratio data collated for the Ovimbundu are not incompatible with some of the statistics recorded for other Negro tribes,

but the technique and results are all too uncertain to allow of clear and definite census statements.

(6) The undoubtedly high death rate of 40 per cent demands further attention. Evidently there is urgent need for more care of mothers during pregnancy and delivery, for increased attention to infant welfare, and for extension of clinical treatment for people of all ages.

VI. SCARIFICATION AND DENTAL MUTILATION

Introduction

Scarification is practiced only to a slight extent among the Ovimbundu, the reasons for the mutilations being therapeutic and esthetic. The following notes give all the information which was available. The data indicate that therapeutic scarification consists of a series of small cuts made over the affected region; no coloring matter is introduced. On the contrary, esthetic scarification, which is adopted chiefly by women, consists of cutting or pricking designs with the point of a knife and rubbing burnt rubber into the cuts.

For details of persons scarified and dentally mutilated see Table I. Of the men measured, only one in six had the typical dental mutilation of the Ovimbundu; namely, a V-shaped notch between the upper central incisors. Only one man in eleven was scarified, and the marking is not heavy. General observation suggests that mutilation of the teeth is less frequent among females than among males, and that the custom is decadent with both sexes.

Notes on Scarification

Plate XXI, Left: Subject No. 17.—The marks were made when the subject was ten or twelve years of age. A male operator passed a needle under the skin and cut along the direction of the needle.

Plate XXI, Right: Subject No. 24.—A woman made the scarification when the boy was a child.

Plate XXII, Left: Subject No. 40.—The marks were made by a male when the subject was a child. The point of a knife was used and burnt rubber was introduced into the cuts, so giving a dark blue appearance to the cicatrice.

Plate XXII, Right: Subject No. 37.—The marks were made by a man when the subject was a child. The appearance of the scar indicates that burnt rubber was introduced into the cuts.

Plate XXIII, Left.—The scar, into which burnt rubber was introduced, was made by a male operator when the subject (a male) was a child ten years of age. The scars were made for ornament.

Plate XXIII, Right.—Information for right figure is the same as for left figure. The scar shown on the left figure is on the right cheek, the scar shown on the right figure is on the left cheek. The forehead design, which is ornamental, and the abdominal scarification to cure a painful spleen are shown in Plate XXX (right).

Plate XXIV.—Two male operators made these designs when the subject (a male) was a boy about thirteen years of age. Each operator made one design. The boy also had his teeth chipped when he was about eight years of age. This subject stated that only males perform tooth mutilation, but either a man or a woman may scarify. The subject paid for this treatment by working half a day for each operator.

Plate XXV: Subject No. 43.—The marks are ornamental, and they show a distinctly blue tinge under the skin. A man was paid for making the marks when the subject was a child.

Plate XXVI: Subject No. 32.—The blue cicatrices are ornamental. No further information was given.

Plate XXVII, Left.—The subject was a woman who stated that the designs were made by her mother's brother when she was a child. The cicatrices were faint and dark blue in color.

Plate XXVII, Right.—Ornamental scars under the eye of a woman. Burnt rubber had been introduced.

Plate XXVIII, Left.—The subject was a woman. The forehead design was made by cutting with a knife, and the other designs by pricking with needles obtained from a white man. The needles were made into a bundle. The operator was her mother's brother, whom she described as *omesāli* (expert). This woman stated that the marking of girls was at one time very common. The girls preferred different designs, but two or more girls could have the same design if they wished.

Plate XXVIII, Right.—This lozenge design was made on a woman. A knife was used for making discontinuous cuts, but no coloring matter was rubbed in.

Plate XXIX.—These designs were made when the subject was a young girl. Her mother's brother was the operator. The marks are of bluish color, and the scar tissue is small. The scar on the left cheek was hardly visible in front view.

Plate XXX, Left: Subject No. 13.—The cuts were made during a cupping (bleeding) operation to cure a pain in the chest.

Plate XXX, Right.—The forehead design of this male is of the ornamental type, namely, a faint scar of bluish color. The abdominal scarification resulted from cupping to cure pain.

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AnAn Anthropologischer Anzeiger
JRAI Journal Royal Anthropological Institute
MAG Mitteilungen der Anthropologischen Gesellschaft in Wien
ZFE Zeitschrift für Ethnologie

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No. 2 No. 5

No. 2 No. 5

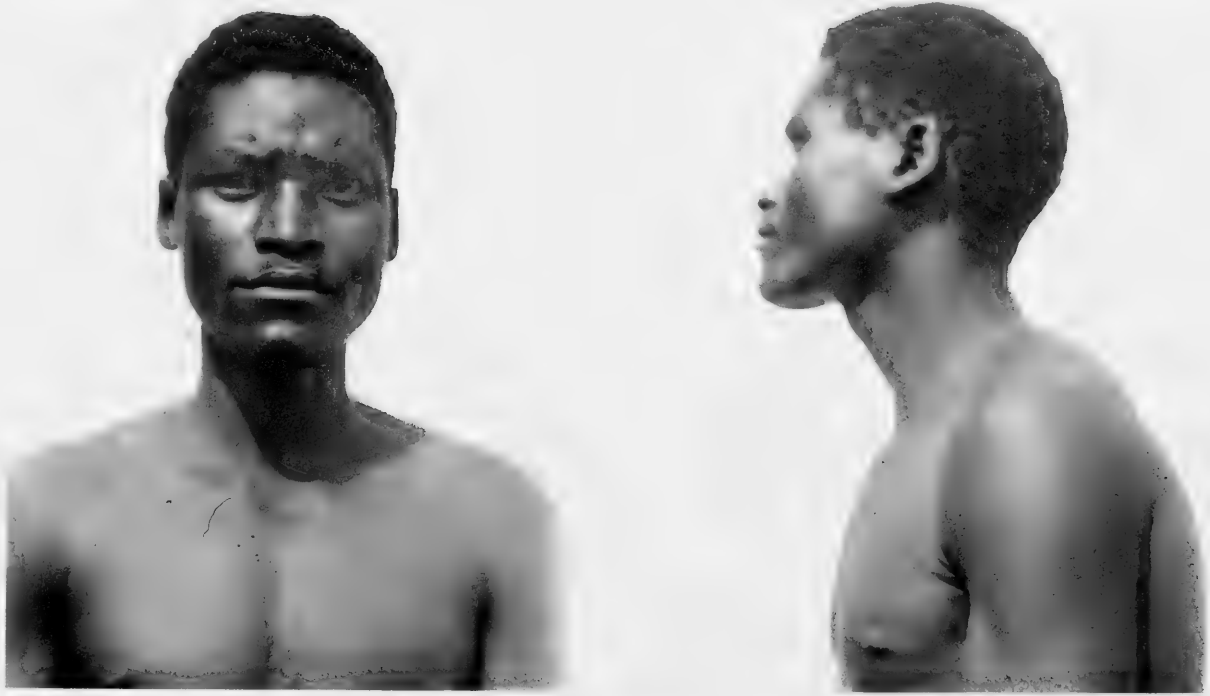
FRONT AND SIDE VIEWS, OVIMBUNDU MALES

No. 10 No. 12

No. 10 No. 12

FRONT AND SIDE VIEWS, OVIMBUNDU MALES

FRONT AND SIDE VIEWS, OCIMBUNDU MALE (No. 20)



FRONT AND SIDE VIEWS, OCIMBUNDU MALE (No. 25)

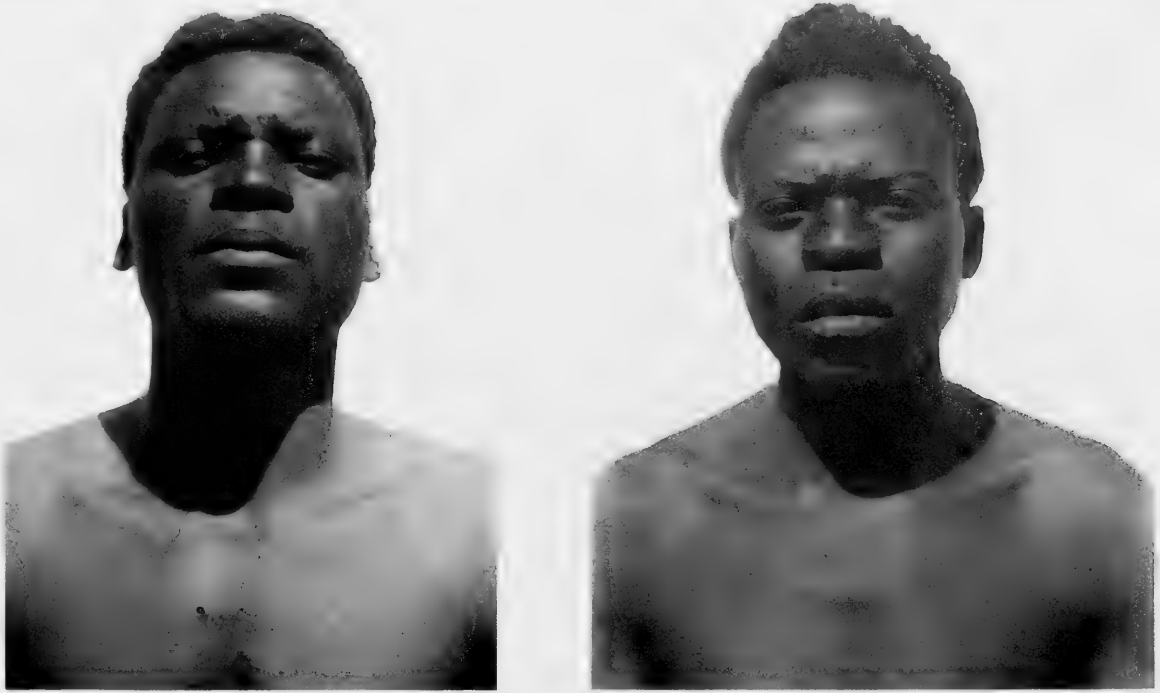
FRONT AND SIDE VIEWS, OCIMBUNDU MALE (No. 27)

FRONT AND SIDE VIEWS, OCIMBUNDU MALE

FRONT AND SIDE VIEWS, OCIMBUNDU MALE (No. 32)

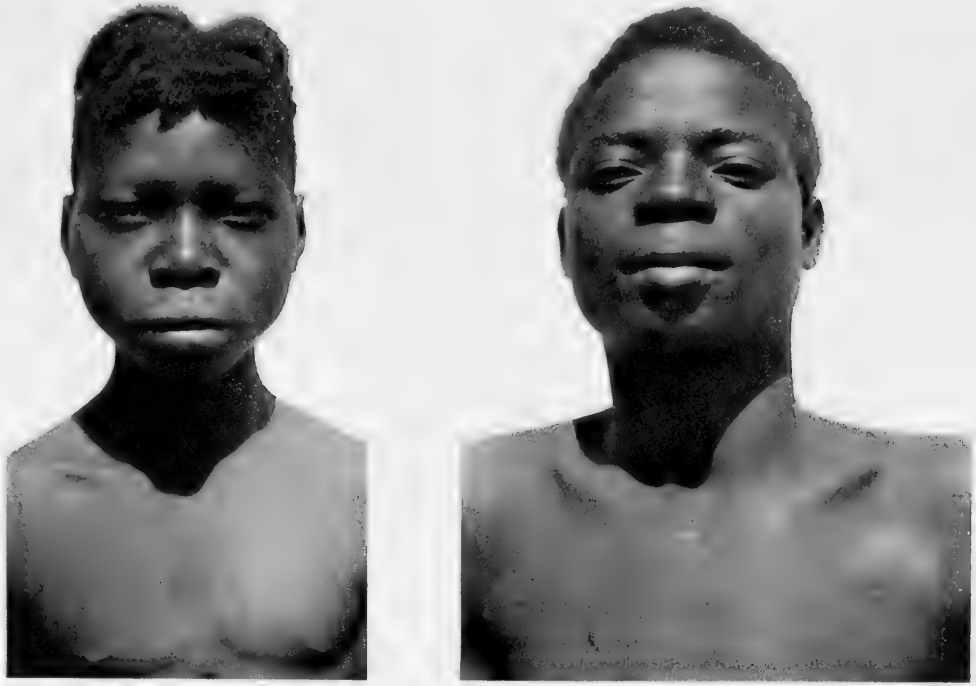
FRONT AND SIDE VIEWS, OCIMBUNDU MALE

FRONT AND SIDE VIEWS, OCIMBUNDU MALE



FRONT VIEWS, OVIMBUNDU MALES

Left: No. 34

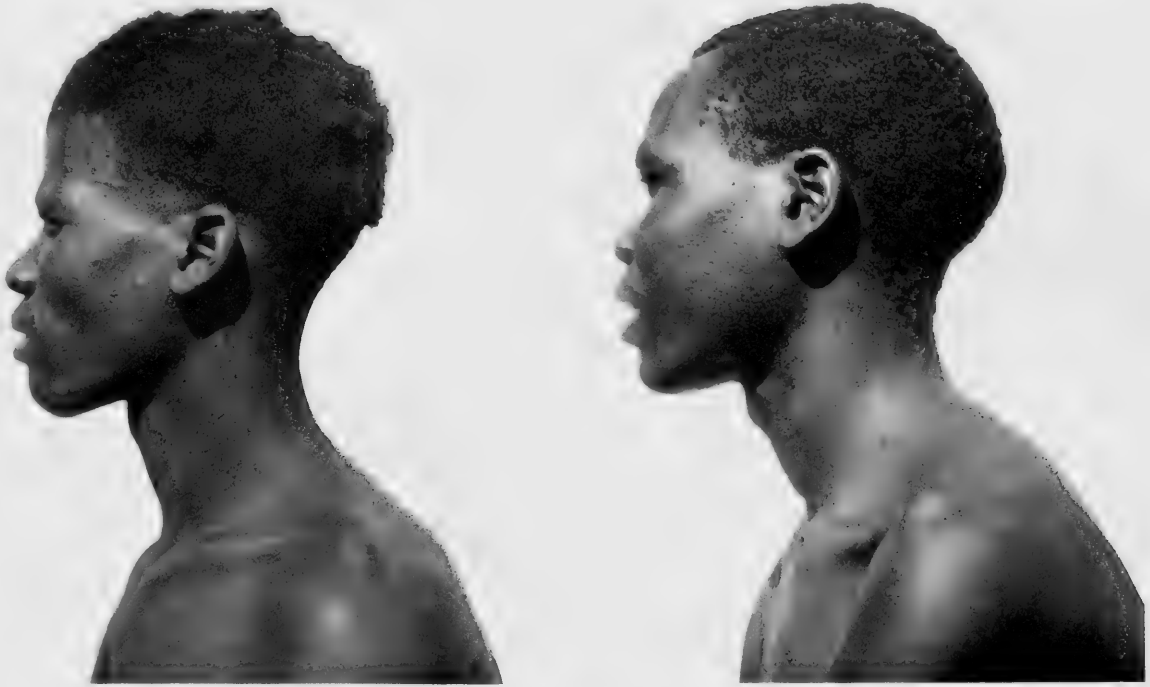


FRONT VIEWS, OVIMBUNDU MALES
Left: No. 22

FRONT VIEWS, OVIMBUNDU MALES

Right: No. 30

SIDE VIEWS, OVIMBUNDU MALES



SIDE VIEWS, OVIMBUNDU MALES

SIDE VIEWS, OVIMBUNDU MALES

No. 12 No. 10

No. 2 No. 5

BACK VIEWS, OVIMBUNDU MALES

See also Plates I and II

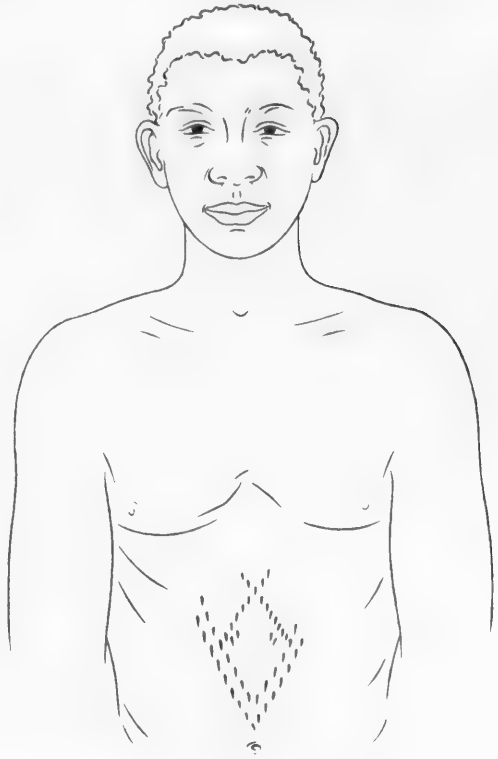
BACK VIEWS, OVIMBUNDU MALES

BACK VIEWS, OVIMBUNDU MALES

DENTAL DEFORMATION

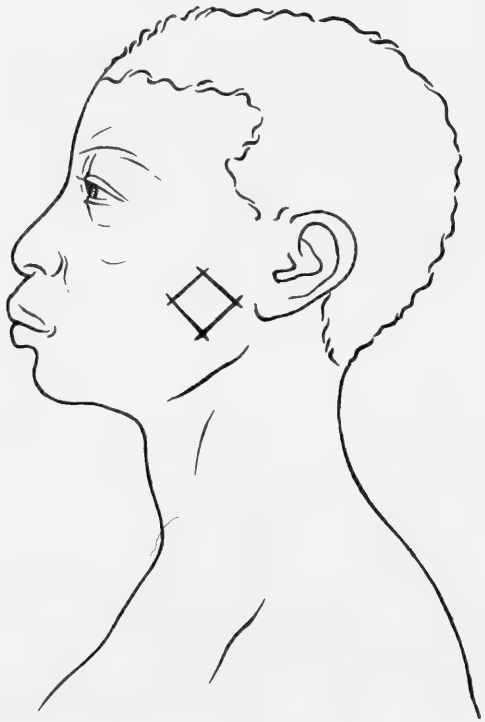
DENTAL DEFORMATION
Upper right: no mutilation

No. 17



No. 24

SCARIFICATION, OVIMBUNDU MALES



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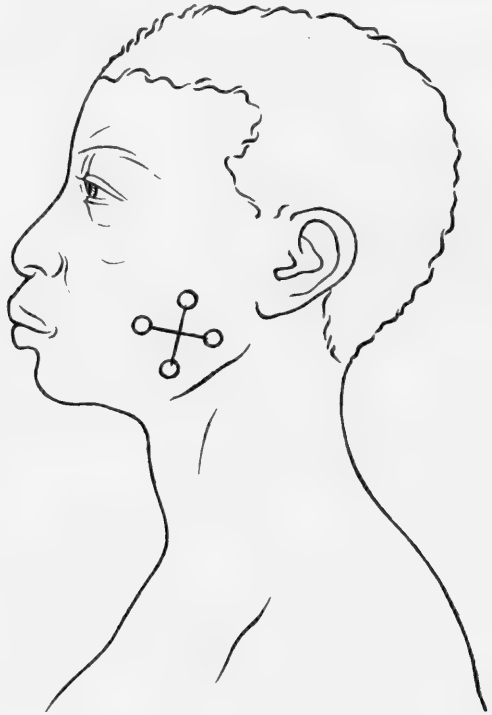

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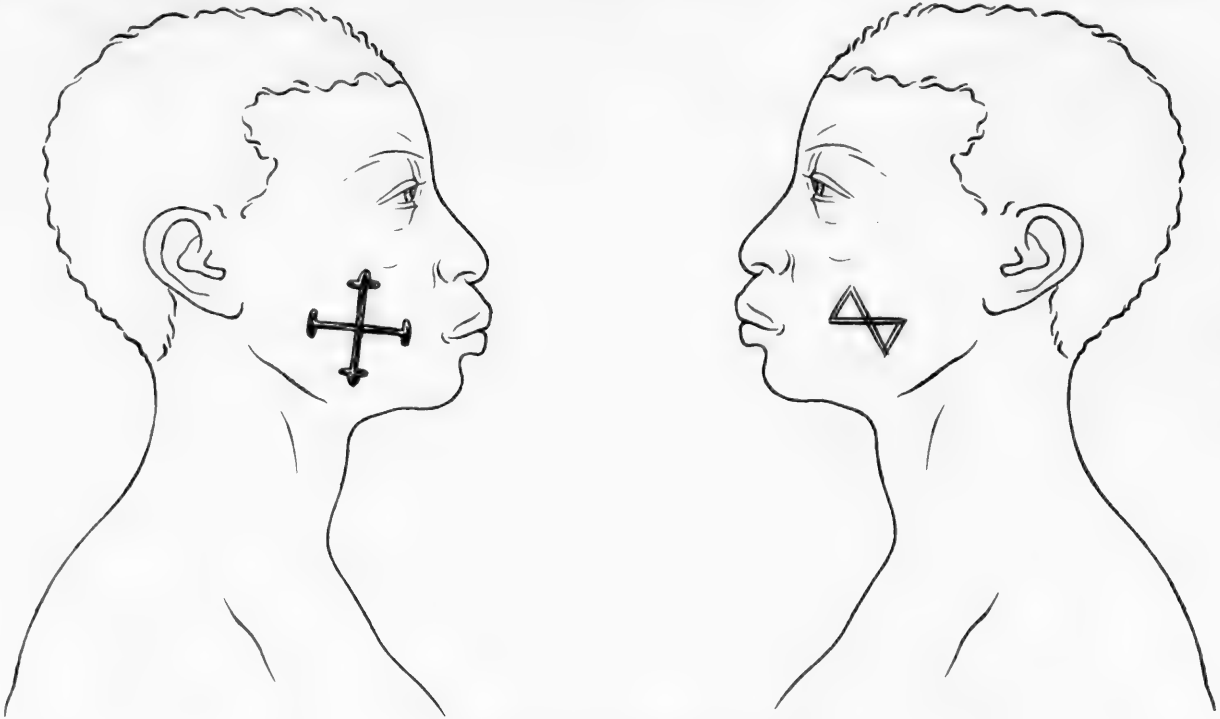
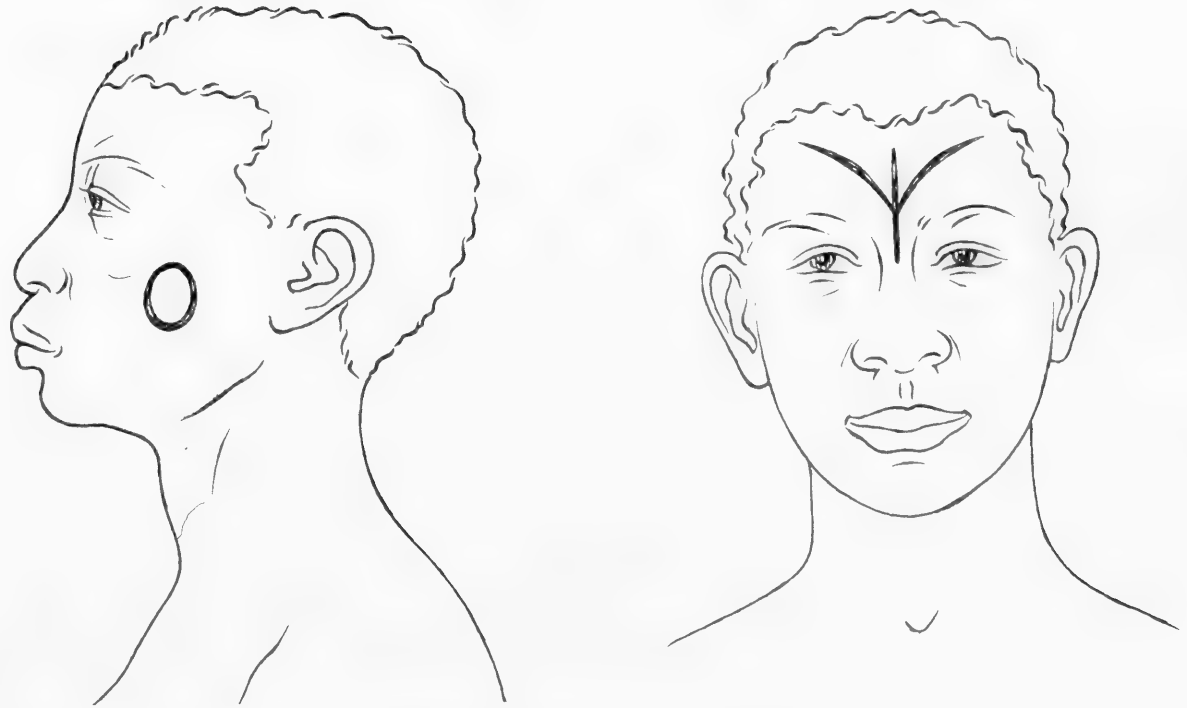
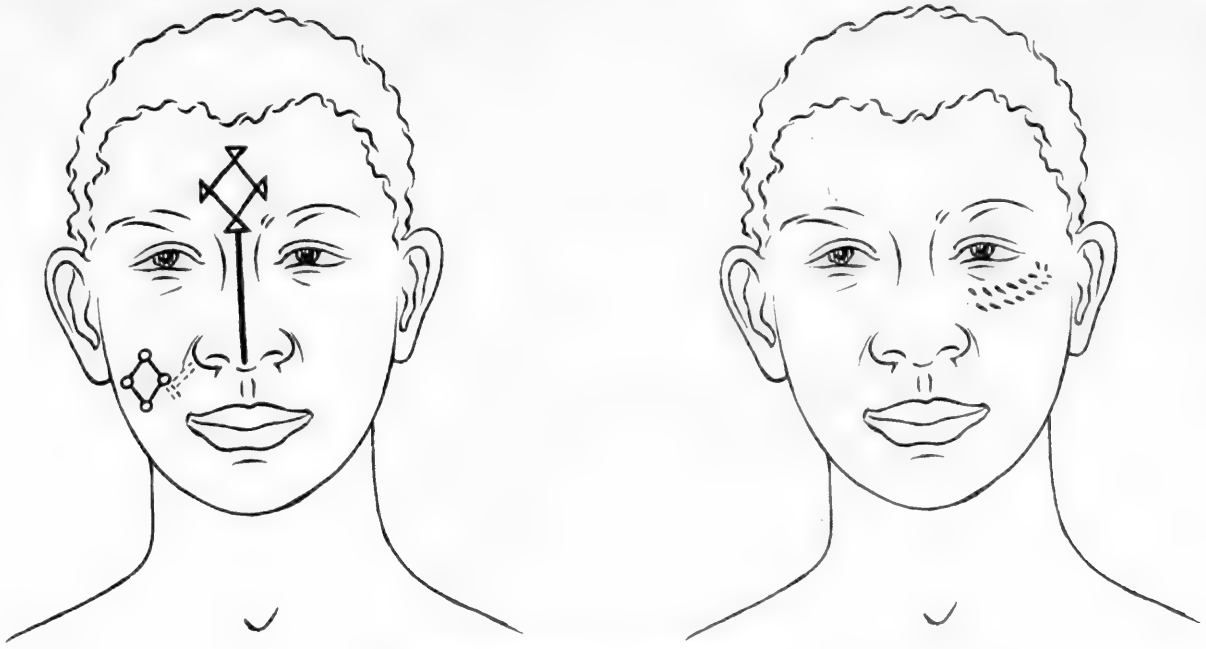


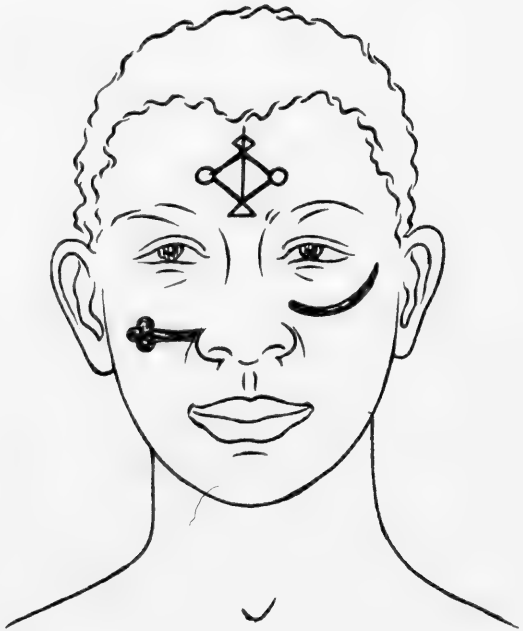
SCARIFICATION, OCIMBUNDU MALE



SCARIFICATION, OCIMBUNDU MALE (No. 32)



SCARIFICATION, OVIMBUNDU WOMEN



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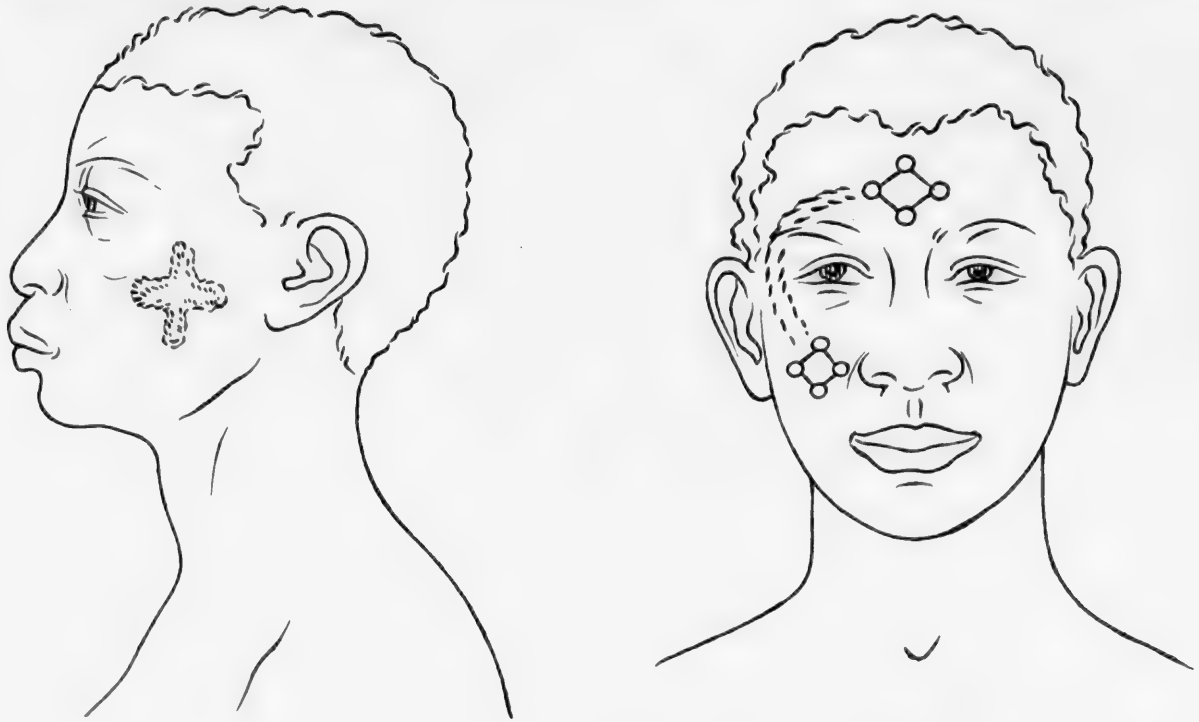
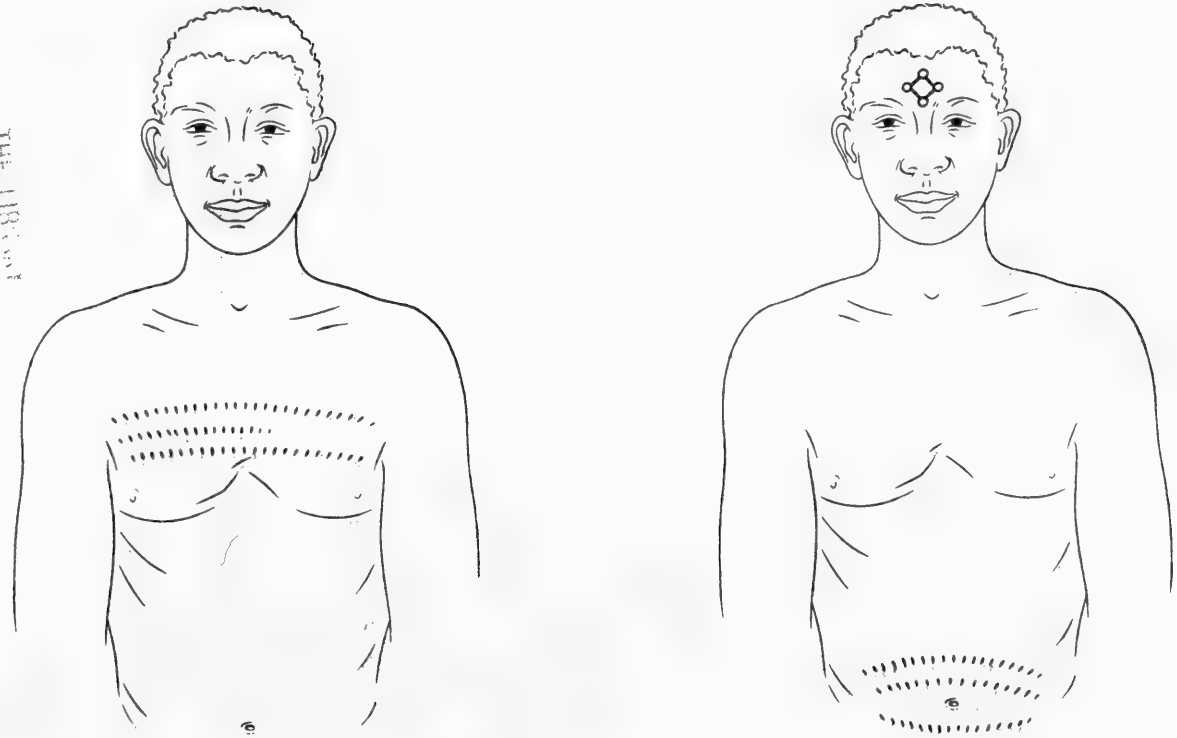


SCARIFICATION, OCIMBUNDU WOMAN



SCARIFICATION, OVIMBUNDU MALES

Left: No. 13